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OF THE
ROYAL GEOGRAPHICAL SOCIETY.

VOLUME THE FORTY-SIXTH.



1876.

EDITED BY THE ASSISTANT-SECRETARY.

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CONTENTS OF VOL. XLVI.

[N.B. The Authors are alone responsible for the contents of their respective papers.]

ILLUSTRATIONS.

Royal Geographical Society.

1876.

REPORT OF THE COUNCIL,

READ AT THE ANNIVERSARY MEETING ON THE 22ND MAY.

THE Council beg to submit to the Fellows the following Report of the financial and general progress of the Society for the past year:—

Members.—During the year ending April 30th 266 Ordinary Members have been elected, of whom 24 paid their Life-compositions. In the previous year (1874-5) the numbers were 294; and in the year 1873-4, 342.

The losses by death have been 70, and by resignation and default of subscription 47, making the net increase 149. In 1874-5 the net increase was 202; in 1873-4, 177; and in 1872-3, 140. Two Honorary Corresponding Members have been elected during the year, and 5 lost by death. The total number of Ordinary Fellows on the List at the end of April was 3,125, of whom 695 were Life Members.

Finances.—As will be seen by the Balance-sheet given at the end of this Report, the total net income for the financial year (ending December 31st, 1875) has been 7934*l.* 15*s.* 10*d.*, of which 6441*l.* 11*s.* consisted of the subscriptions of Fellows. In the previous year (1874) these amounts were: 7511*l.* 11*s.* 10*d.*

and 6425*l.* 1*s.* 6*d.* respectively; and in 1873, 6752*l.* 4*s.* 4*d.* and 5643*l.* 19*s.* 6*d.*

The expenditure (exclusive of investments and balances) was 5683*l.* 4*s.* 10*d.* In the preceding year the amount was 6992*l.* 7*s.* 2*d.*, a difference accounted for by the smaller total shown in the present balance-sheet as expended on Expeditions, viz., 621*l.* 3*s.* 4*d.*, as compared with 1955*l.* 13*s.* 10*d.** The ordinary expenses of administration, publications, Library, &c., as will be seen in comparing the present with the preceding balance-sheet, remain about the same, having been 5051*l.* 11*s.* 6*d.* in 1875, and 5026*l.* 3*s.* 4*d.* in 1874.

The Finance Committee of the Council have, as usual, held their Monthly Meetings throughout the year, supervising the accounts of the Society. The annual Audit was held early in April, the Auditors being:—On the part of the Council, the Right Hon. Lord Cottesloe and Sir Charles Nicholson, Bart.; and on that of the Fellows, H. Jones Williams, Esq.† The Council take this opportunity of expressing their cordial thanks, in which they are sure the Fellows at large will concur, to these experienced gentlemen, who have, as in so many previous years, willingly given their time and abilities to this important task.

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* This amount is exclusive of the expenditure on behalf of the Congo Expedition, which, being reimbursed by Mr. James Young, does not enter into this comparison of the actual expenditure of the Society.

† General Sir George Balfour, M.P., one of the Auditors appointed on behalf of the Fellows, was unable to attend, owing to other pressing engagements.

STATEMENT showing the RECEIPTS and EXPENDITURE of the Society from the Year 1848 to the 31st Dec. 1875.

In 1856 a Treasury Grant of 1000*l.* for the East African Expedition received.

In 1860 a Treasury Grant of 2500*l.* for the East African Expedition received.

In 1869 Legacy of Mr. Benjamin Oliveira, 1506*l.* 17*s.* 1*d.*

In 1870 Legacy of Mr. Alfred Davis, 1800*l.*

In 1871 Legacy of Sir Roderick Murchison, 1000*l.*

In 1872 Amount of Mr. James Young's Grant for the Livingstone Congo Expedition, 2000*l.*

In 1874 Amount of Mr. James Young's Grant for the Livingstone Congo Expedition, 1041*l.* 14*s.*

Year.	Cash Receipts within the Year.			Cash Amounts invested in Funds.			Deducting Amounts invested in Funds; actual Expenditure.		
	£.	s.	d.	£.	s.	d.	£.	s.	d.
1848	696	10	5	..	..		755	6	1
1849	778	3	0	..	..		1098	7	6
1850	1036	10	5	..	..		877	2	10
1851	1053	11	8	..	..		906	14	7
1852	1220	3	4	..	..		995	13	1
1853	1917	2	6	..	..		1675	6	0
1854	2565	7	8	..	..		2197	19	3
1855	2584	7	0	..	..		2636	3	1
1856	3372	5	1	533	10	0	2814	8	1
1857	3142	13	4	378	0	0	3480	19	9
1858	3089	15	1	..	..		2944	13	6
1859	3471	11	8	950	0	0	3423	3	9
1860	6449	12	1	466	17	6	5406	3	7
1861	4792	12	9	1358	2	6	3074	7	4
1862	4659	7	9	1389	7	6	3095	19	4
1863	5256	9	3	1837	10	0	3655	4	0
1864	4977	8	6	1796	5	0	3647	7	10
1865	4905	8	3	1041	5	0	4307	4	5
1866	5085	8	3	1028	15	0	4052	15	0
1867	5462	7	11	1029	0	6	3943	17	4
1868	5991	4	0	1857	3	9	4156	17	10
1869	6859	16	0	2131	5	0	4646	0	8
1870	8042	6	1	3802	6	0	3845	10	6
1871	6637	3	7	1000	0	0	3726	4	4
1872	8119	7	9	1999	4	6	5871	13	2
1873	7761	18	10	2015	1	8	6697	12	6
1874	8753	5	10	499	0	0	7876	2	3
1875	7934	15	10	2002	7	6	5683	4	10

STATEMENT of ASSETS—31st December, 1875.

					£	s.	d
Freehold House, Fittings, and Furniture, estimated (exclusive of Map Collections and Library) ..				..	20,000	0	0
Investments, viz.:—							
India 5 per Cent. Stock	£1000	0	0				
Great Western Railway 4½ per Cent. Debenture Stock (Davis Bequest)	1800	0	0				
London and North-Western Railway 4 per Cent. Debenture Stock (Murchison Bequest)	1000	0	0				
North-Eastern Railway 4 per Cent. Debenture Stock	1000	0	0				
Great Indian Peninsula Railway Guaranteed 5 per Cent. Capital Stock	4000	0	0				
March Exchequer Bills	1000	0	0				
					9,800	0	0
Balance at Bank and in hand					1,015	3	6
				Total	£30,845	3	6

Publications.—The 45th volume of the 'Journal' was published in February last, and the greater portion of the impression has already been distributed to Fellows applying for their copies. Volume 19 of the 'Proceedings' has also been completed, and the concluding parts circulated, since the last Report. Three numbers of Volume 20 have also been issued during the present Session.

Livingstone Aid Expeditions.—The last of these Expeditions undertaken by the Society has been recently brought to a successful close by the return of Lieutenant Cameron to England, after accomplishing the great feat of traversing Equatorial Africa, from Zanzibar to the Portuguese possessions, on the Coast of Angola. As stated in the last Council Report, the title of "Livingstone East Coast Aid Expedition," originally given to this undertaking, was changed to that of "Cameron Expedition," on the fresh start made by its distinguished leader, after receiving and sending home the remainder of Dr. Livingstone's property at Ujiji. In the present balance-sheet a small part only appears of the great expenditure incurred by the Expedition since leaving Ujiji, and especially in the purchase and equipment of a schooner at Loanda for the purpose of sending safely to their homes the 57 Zanzibar negroes who accompanied their leader across the continent. The greater portion will fall into the accounts of 1876, the bills having been presented since the close of 1875. The Council are unable at present to state the exact total amount that will be chargeable in the next Balance Sheet, but estimate it at about 3000*l.*

Library.—The Library now contains 17,164 books and pamphlets, of which 765 were added during the past year, 551 (including all the pamphlets) being donations, and 214 purchased. Besides these, and without reckoning newspapers, 1632 separate parts or numbers of periodicals, Transactions, Reports, &c., have been received. 23 whole volumes and 140 separate parts have been obtained, for the most part by gift, in or towards completion of defective series.

In addition to the numerous pamphlets and small works put into covers on the Society's premises, 541 volumes have been bound and 193 repaired during the past year.

The sum of 156*l.* 2*s.* 2*d.* has been expended by the Library Committee in purchasing books, and the further sum of 134*l.* 5*s.* in binding.

The balance of the donation of 200*l.* by the late Admiral Sherard Osborn, to be applied in the purchase of books, has been so expended, and the following is a list of the whole works purchased with the fund:—D'ORBIGNY, Voyage dans l'Amérique méridionale, D'URVILLE, Voyage au Pole Sud, DUPERREY, Voyage de la *Coquille*, VAILLANT, Voyage de la *Bonite*, BARKER-WEBB and BERTHELOT, Histoire des Iles Canaries, ROSS, Zoology and Botany of the Voyage of the *Erebus* and *Terror*, FITZROY, Zoology of the Voyage of the *Beagle*, RICHARDSON, Fauna Boreali-Americana, LABORDE, Voyage de l'Arabie Pétrée, MARSILI, Danubius Pannonico-Mysicus, HUMBOLDT, Voyage aux Régions équinoxiales, PERRY, Expedition to China Seas, HUMBERT, Le Japon illustré, HENNEPIN, Nouvelle découverte and Nouveau Voyage dans l'Amérique, and WILKINSON, Topography of Thebes; in all, 87 volumes (including 13 folio Atlases of coloured plates).

Apart from these works, among the more important accessions, are:—16 bound volumes of pamphlets and Parliamentary Reports relating to the search for Sir John Franklin (presented by John Barrow, Esq.); Narratives of the Voyages of Cieça de Leon, Piedrahita, Zarate, Gomara, Torquemada, Oviedo, Herrera, Cabeza de Baca, Frezier, Acosta, and Cortés, with other valuable works on ancient Peruvian geography and history (presented by C. R. Markham, Esq.); a collection of 76 valuable geographical works (presented by General Sir W. Codrington); Juan and Ulloa's Relacion del Viage a la America meridional, and 6 vols. of Ramon de la Sagra's Historia de la Isla de Cuba (presented by J. P. Gassiot, Esq., Junr.); Reports on the Revenue, Topographical and Archæological Surveys of India, with 4 Manuals of Madras districts (presented by H.M. Secretary of State for India); Bory de St. Vincent's Expédition Scientifique de Morée; Choris's Voyage pittoresque autour du Monde; Schweinfurth's Artes Africanæ; the China Port Catalogues, 1863-72; Wilkinson's Ancient Egyptians; Demarcacion politica del Peru (presented by the President of the Republic); Calancha's Coronica de S. Augustin en el Peru; the travels of Macarius and Evliya

Efendi, and all other works of geographical interest issued by the Oriental Translation Fund; the completion of Lartet and Christy's Reliquiæ Aquitanicæ, and the commencements of Raimondi's Peru and Reclus's Géographie universelle (presented by the Authors); and the volumes hitherto wanting to complete the Library series of the Journal Asiatique, Tour du Monde, Revue Maritime et Coloniale, Baer und Helmersen's Beiträge zur Kenntniss der Russischen Reiches, Erman's Archiv von Russland, and of the publications of the Ethnological and Hakluyt Societies. A complete set of the Addresses of Presidents of the Royal Geographical Society, and a duplicate series of the Journals, Proceedings, and other publications of the Society, have been obtained for Library use.

101 photographic views of Spitzbergen have also been presented to the Library by Count Wilczek; 25 photographs of various parts of the Territories, by Dr. F. V. Hayden; and models of the Aztec Sacrificial and Calendar stones, by C. H. Wallroth, Esq.

The above additions and the entire re-arrangement of the Library have rendered the erection of two further presses necessary; and the purely geographical part of the Library has been re-pressmarked, similar work being now in hand as to the remaining portion, under the superintendence of the Library Committee of Council, which has held its usual meetings.

The period of retaining recently-acquired books before lending to Fellows has been, since the last Report of Council, reduced from twelve to six months.

The Library continues to be much consulted by Fellows of the Society, private students, authors, and officers of the public departments; and it is expected that the numbers of such visitors will be materially augmented, when its rapidly increasing value for general science as well as pure geography becomes better known.

Map-Room.—Since the last Anniversary, 1 Globe, 578 Maps on 1491 Sheets, 18 Atlases comprising 524 Maps, 31 Relief-Maps and Models, and 8 Photographs and Portraits, have been added to the Collection; of which 107 Sheets of Maps and 3 Atlases, and the Relief-Maps and Models, have been acquired by purchase; 8 Diagrams have also been constructed,

and 7 Pictorial Illustrations obtained, for the Evening Meetings.

The more important accessions are:—1 Terrestrial Globe, 36 inches diameter; presented through Admiral E. Ommanney by the Sir James C. Ross Memorial Committee. 754 Sheets of the Ordnance Surveys of Great Britain and Ireland, on various scales; presented by the First Commissioner of Works, through Sir Henry James and Major-Gen. Cameron. 93 British Admiralty Charts; presented by the Lords Commissioners of the Admiralty, through Capt. F. J. O. Evans, Hydrographer. 187 Sheets of the various India Surveys; presented by H.M. Secretary of State for India, through the India Office. 89 French Admiralty Charts; presented by the Dépôt des Cartes et Plans de la Marine. Maps and Photographs issued by the U.S. Geological and Geographical Survey of the Territories; presented by Professor F. V. Hayden, Director. Maps of Routes and Reconnaissances made by Officers of the Egyptian Staff Expedition; presented by General Stone, Chief Staff, Egyptian Army; also several duplicate copies, presented by H.R.H. the Prince of Wales. MS. maps executed by Officers of Col. Gordon's Expedition to the Upper Nile; presented by Col. Gordon. 4 Sheets of the Swedish Geological Survey; presented by Otto Torell, Director. 73 Sheets of Special Map of the Austro-Hungarian Monarchy, scale $\frac{1}{75000}$; purchased. Atlas of Works executed by the European Commission of the Danube, 2nd volume; presented by the Foreign Office. Handtke's Map of European Turkey, on 20 Sheets; presented by Carl Flemming, publisher. 21 Maps of European Countries; presented by Lord Arthur Russell. Railway Map of Sweden, Norway, and Denmark, 1875, on 6 Sheets; purchased. Geological Map of Austro-Hungarian Monarchy; purchased. 2 Maps of the City and Environs of Milan; presented by Antonio Vallardi, publisher. Statistical Atlas of United States; presented by Prof. F. A. Walker, Superintendent of 9th census. Map of British Guiana; presented by H.E. the Governor. 8 Sheets of a Topographical Atlas of the United States West of the 100th meridian; presented by Lieut. J. M. Wheeler, U.S. Army. 13 Maps of Portions of United States Territories; presented by Spencer Curley, Esq. Parts 21 to 30 of Stieler's Atlas of Modern Geography, and Parts 12 and 13 of Spruner's

Atlas of Medieval Geography; presented by Justus Perthes, publisher. Philips' Handy General Atlas of the World, and Atlas of the Counties of England; presented by Messrs. Philip and Son, publishers. Reproduction of Celestial and Terrestrial Globes by Mercator, 1541–51, in gores; presented by Baron Solvyns, Belgian Minister. Topographical and Statistical Atlas of Bagelen Presidency, Java; purchased. Maps of Khuzistan, South-Western Arabia, and Trans-Keian Territory, Cape Colony; presented by Quartermaster-General's Department, Horse Guards. Map of Natal, 1875; presented by Dr. Sutherland. Map of proposed Trade-routes between India and China; presented by J. Ogilvy Hay, Esq. Map of the Ortos Country, Mongolia, and MS. route-map between Bhamo and Mung-mau; presented by Ney Elias, Esq. MS. map and section of route across Africa from Zanzibar to Benguela, by Lieut. Cameron, R.N. Stanley's MS. Map of the Victoria Nyanza; presented by Edwin Arnold, Esq. Traverse Survey of the White Nile from Khartoum to Rigaf, MS.; presented by Lieut. Watson, R.E. MS. map of route from Champion Bay to Overland Telegraph-line, Australia; presented by John Forrest, Esq. 9 Geological Maps of Australia and parts of Victoria, issued by the Mining Department, Melbourne; presented by Jess Young, Esq. Map of the City of Rio de Janeiro; purchased. Photograph of the Town of Zanzibar; presented by Arthur Laing, Esq. 30 Geographical Models and Relief-maps selected from Paris Exhibition 1875; purchased.

BALANCE-SHEET FOR THE YEAR 1875.

Receipts.

1875.	£	s.	d.	£	s.	d.	£	s.	d.
Balance in Bankers' hands 31st Dec. 1874				789	7	9			
Ditto Accountant's Ditto				6	12	3	796	0	0
Subscriptions:—	£	s.	d.						
For the current year ..	3482	15	0						
Arrears	566	16	0						
Paid in Advance ..	424	0	0	4473	11	0			
Entrance Fees				720	0	0			
Life Compositions				1248	0	0	6441	11	0
Subscriptions paid in error, &c.				..	..		95	8	6
Parliamentary Grant				..	..		500	0	0
Royal Premium				..	..		52	10	0
Rent of Vaults				..	..		262	10	0
Sale of Publications				..	..		180	10	2
Advertisements				..	..		34	18	0
Dividends:—									
1000*l*. London and North-Western Railway 4 per Cent. Debenture Stock ..				39	13	4			
1000*l*. North-Eastern Railway 4 per Cent. Debenture Stock				39	13	4			
3120*l*. Great Indian Peninsula Railway 5 per Cent. Stock				132	17	8			
1000*l*. India 5 per Cent. Stock				49	11	8			
1800*l*. Great Western Railway 4½ Debenture Stock				75	17	2			
1000*l*. Exchequer Bills				29	15	0	367	8	2
							£8730	15	10

Expenditure.

1875.	£	s.	d.	£	s.	d.
Taxes, &c.	36	10	0			
Salaries and Wages	1834	8	0			
Library and Map-Room	545	4	1			
Overpayments returned	87	6	0			
Gold Medals, School Prizes, and other awards	223	5	0			
Postages, &c.	216	19	4			
Office Expenses, Coals, Gas, Stationery, Meetings, &c.	360	4	1			
Publications, Illustrations, &c.	1590	14	4			
Furniture and Repairs	106	19	8			
Instruments for Paris Exhibition, Repairs, &c.	50	1	0	5051	11	6
Expeditions:—						
Instruments for Capt. Allen Young	13	2	6			
Instruments for the Arctic Expedition	10	2	0			
Instruments for Mr. E. D. Young ..	16	19	0			
Amount expended on account of Lieut. Grandy's Congo Expedition (balance defrayed by the Society)	70	5	10			
Amount contributed to the Cameron Expedition Fund	510	14	0	621	3	4
Subscription to the Margary Memorial Fund	..	..		10	10	0
Investment:—						
Purchase of 1760*l*. Great Indian Peninsula Railway Stock	..	..		2002	7	6
Balance in Bankers' hands	1012	7	5			
Do. Accountant's Do.	32	16	1	1045	3	6
				£8730	15	10

REGINALD T. COCKS,
Treasurer.

Audited and found correct, 7th April, 1876.

COTTESLOE,
CHAS. NICHOLSON,
H. JONES WILLIAMS, } Auditors.

ROYAL GEOGRAPHICAL SOCIETY.

HONORARY AND HONORARY CORRESPONDING MEMBERS.

MARCH 24, 1877.

HONORARY.

H. I. M. Dom Pedro II., Emperor of Brazil.
H.M. Victor Emmanuel II., King of Italy.
H.M. Dom Luiz I., King of Portugal.
H.M. Leopold II., King of the Belgians.
H.I.H. the Grand Duke Constantine, Pres. of the Imp. Geogr. Soc. of St. Petersburg.
H.R.H. the Duke of Edinburgh.
H.H. Ismail Pacha, The Khedive of Egypt.
H.H. Syed Barghash Ibn Sye Saïd, Sultan of Zanzibar.
H. M. Oscar II., King of Sweden and Norway.

HONORARY CORRESPONDING.

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ALMEIDA, Dr. Candido Mendes de.
BALBI, M. Eugène de.
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HAUSLAB, General .. .. .. Vienna
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KENNELLY, D. J. Esq., F.R.A.S.
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KIEPERT, Dr. H. .. .. Berlin
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LINANT Pasha .. .. .. Alexandria
LÜTKE, Admiral Count F. B., St. Petersburg
MADOZ, Don Pascual .. .. .. Madrid
MALTE-BRUN, M. V. A., Hon. Sec. Geogr. Soc. of.. .. .. Paris
MIRZA MALCOM KHAN, His Excellency, (Persian Minister).
NEGRI, Chevalier Cristoforo, Contrada San Francesco di Paola, No. 11, P. 2 .. Torino
NOURY, Vice-Admiral Baron de la Roncière le, Pres. French Geog. Soc. .. Paris
NUBAR PACHA, His Excellency .. Cairo
OSTEN SACKEN, Baron Fr. von der, St. Petersburg
PARDO, His Excellency Don Manuel (Pres. Republic of Peru) .. .. .. Lima
PETERMANN, Dr. Augustus .. .. Gotha
PHILIPPI, Dr. Rodulfo Armando .. Chili
PLATEN, His Excellency Count.
RAIMONDI, Don Antonio .. .. .. Lima
RICHTHOFEN, Baron von, (Pres. Berlin Geog. Soc. Berlin), 71 Steglitzer Strasse, Berlin
RÜPPELL, Dr. E., For. M.L.S. .. Frankfort
SALAS, Don Saturnino, Pres. Topo. Depart., Argentine Repub. .. .. Buenos Ayres
SCHERZER, Dr. Karl von.
SCHUYLER, EUGENE, Sec. U. S. Legation, Constantinople
SOLDAN, Don Mariano Felipe Paz Lima
SONKLAR, Major-General the Chev. de, Wiener Neustadt .. .. .. Vienna
STONE, Gen. C. M. P., Chief of the General Staff, Egyptian Army .. .. .. Cairo
STRUVE, Prof. Otto, .. St. Petersburg
TCHIHATCHEF, M. Pierre de, 1 Piazza deyli Zuave .. .. Florence
TSCHUDI, Herr T. T. von .. .. Vienna
VÁMBÉRY, Professor Arminius .. Pesth
VASCONCELLOS É SILVA, Dr. Alfredo Casimiro de .. .. .. Rio de Janeiro
WHITNEY, J. D., Esq. (State Geologist for California), Cambridge, Massachusetts, U.S.
WILCZEK, Count .. .. .. Vienna
ZIEGLER, M. J. M. .. .. Winterthur

FELLOWS

(March 24th, 1877.)

N.B.—*Those having * preceding their names have compounded for life.*

Year of Election.	
1876	Abbott, Major-General Saunders. 2, *Petersham-terrace, Queen's-gate, S.W.*
1868	*Abbott, Wm. S. D., Esq. 28, *Pembridge-crescent, W.*
1874	Abd-Ell-Rasak Bey. *Naval College, Alexandria.*
1863	Abdy, Rev. Albert, M.A. *Broad-st., Stamford; and United University Club, S.W.*
1859	Aberdare, Hy. A. Bruce, Lord. 1, *Queen's-gate, S.W.; and Duffryn, Aberdare, Glamorganshire.*
1851	Abinger, W. F. Scarlett, Lord. *Guards' Club, S.W.*
1876	Abrahams, Israel, Esq. 56, *Russell-square, W.C.*
1865	Acheson, Frederick, Esq., C.E. *Wooden Bridge, Co. Wicklow.*
1872	Acland, Dr. Henry, F.R.S., D.C.L., M.D. *Oxford.*
1861	10 Acland, J. Barton Arundel, Esq. *Mount Peel, Canterbury, New Zealand. Care of A. Mills, Esq.,* 34, *Hyde-park-gardens, W.*
1874	Acland, Sir Thos. Dyke, Bart., M.P. *Killerton, Exeter; and Athenæum Club.*
1873	Acland, Lieutenant W. A. Dyke, R.N. *Care of Dr. H. Acland, Oxford.*
1873	Adams, Fras. O., Esq. (Secretary of Embassy). *Berlin.*
1872	Adams, W. J., Esq. *Care of Messrs. G. H. Payne and Co.,* 150 & 151, *Fenchurch-street, E.C.*
1876	Adams, Wm. Maurice, Esq. *The Cathedral, Manchester.*
1873	Adkins, Thomas, Esq. *H.M. Consul at Newchwang, China.*
1876	Agar, A. P., Esq. *Care of Messrs. Grindlay and Co.,* 55, *Parliament-street, S.W.*
1859	Ainslie, Colonel H. Francis. *Burlington-chambers,* 180, *Piccadilly, W.; and United Service Club, S.W.*
1830	*Ainsworth, W. F., Esq., F.S.A. *Ravenscourt-villa, New-road, Hammersmith, W.*
1876	20 Aird, David Alfred, Esq. 2, *Sussex-gardens, W.; and* 7, *Figtree-court, Temple, E.C.*
1859	Airlie, David Graham, Earl of, K.T. *Holly-lodge, Campden-hill, Kensington, W.*
1860	Aitchison, David, Esq. 5, *Pembridge-square, Bayswater, W.*
1873	Aitken, Russell, Esq. 36, *Great George-street, S.W.*
1876	Akroyd, Colonel Edward. *Bank Field, Halifax, Yorks.*
1830	*Albemarle, George Thomas, Earl of. 11, *Grosvenor-square, W.; Quiddenham-hall, Larlingford, Norfolk; and Elvedon-hall, Suffolk.*
1862	Alcock, Sir Rutherford, K.C.B., D.C.L., &c. 14, *Great Queen-street, Westminster, S.W.; and Athenæum Club, S.W.*
1838	*Aldam, William, Esq. *Frickley-hall, near Doncaster.*
1865	Aldom, Joseph R. Esq., M.A., PH. DR. *Salway-house, Leyton, Essex.*

Year of Election.	
1857	Aldrich, Captain Robert D., R.N. *Windmill-road, Croydon, Surrey.*
1830	30 Alexander, General Sir Jas. Ed., K.C.L.S., F.R.A.S., F.R.S.E., &c. (14th Regt). *United Service Club, S.W.; and Westerton-house, Bridge of Allan, N.B.*
1873	Alexander, W., Esq. *Care of Messrs. Grindlay and Co.,* 55, *Parliament-street.*
1870	Alford, Lewis, Esq. 2, *Little Love-lane, E.C.*
1872	Allan, G. W., Esq. *Moss Park, Toronto, Canada. Care of Major Aylmer,* 50, *Jermyn-street, S.W.*
1864	Allen, C. H., Esq. 1, *West-hill, Highgate.*
1871	*Allcroft, John D., Esq. 108, *Lancaster-gate, W.; Harlington, Middlesex; and Stokesay, Shropshire.*
1874	Allen, C. F. R., Esq., H.M. Consular Service, *China. Care of G. B. Allen, Esq.,* 4, *Paper-buildings, E.C.*
1876	*Allen, Herbert J., Esq., H.M. Consular Service, *China.* 10, *The Norton, Tenby.*
1865	Allen, James Pearce, Esq. 13, *Waterloo-place, S.W.*
1873	Allen, John Seymour, Esq. *Woodfield, Pembroke; and Balliol-college, Oxford.*
1872	40 Allen, Thos. B., Esq. 40, *Regent's-park-road, N.W.*
1862	*Almeda, Emnauel de, Esq. 11, *Hyde-park-gardens, W.*
1876	Alstone, John, Esq. 40, *Rye-lane, Peckham, S.E.*
1877	*Alt, W. J., Esq. *Woburn-park, Weybridge; and Thatched-house Club, St. James's-street, S.W.*
1874	Altschul, Dr., M.A., F. R. HIST. SOC., M.C.P., M.S.A., M. PHILOLOG. SOC., LOND., &c., 9, *Old Bond-street, W.*
1876	Ambler, Vincent, Esq., M.D. *Colville-house, Colville-square, Bayswater, W.*
1874	Ames, Capt. Lionel Neville Frederick. *The Hyde, Harpenden.*
1875	Ameuney, Professor Antonius, F.R.A.S. 87, *Seymour-street, Hyde-park, W.*
1872	Amstel, Jonkheer J. W. Ploos Van, Esq. (Knight of the Order of the Netherland Lion, and His Netherland Majesty's Con.-Gen. for the Australian Colonies and New Zealand). *Keizersgracht, No.* 163, *Amsterdam. Care of Messrs. Hickie, Borman & Co.,* 127, *Leadenhall-street, E.C.*
1854	Ancona, J. S., Esq. 8, *John-street, Adelphi, W.C.*
1874	50 Anderson, Alex. Dunlop, Esq. *Ardsheal, Ballachulish, Argyleshire.*
1874	Anderson, Geo., Esq., Deputy Inspector-General of Army Hospitals. *Care of Sir Charles M'Gregor and Co., Charles-street, S.W.*
1867	Anderson, Sir Henry L., K.C.S.I. *India-office, S.W.*
1871	Anderson, Sir James. 16, *Warrington-crescent, W.*
1862	Anderson, James, Esq. 1, *Billiter-court, City, E.C.*
1876	Anderson, R., Esq. 17, *St. Helen's-place, E.C.; and Hankow.*
1876	Anderson, Capt. S., R.E. *Horse-Guards, Whitehall, S.W.; and Junior United Service Club, Charles-street, S.W.*
1870	Anderson, Wm. Jas., Esq. *Sans Souci, Newlands, near Cape Town, Cape of Good Hope. Care of Messrs. Sinclair, Hamilton and Co.,* 17, *St. Helen's-place, E.C.*
1873	Anderson, Colonel W. W. 15, *Westbourne-square, Bayswater; and Lakefield, Glen Urquhart, Inverness.*
1876	Andrew, Capt. Chas. W. 2, *Foxley-road, Brixton, S.W.*
1856	60*Andrew, William P., Esq. 29, *Bryanston-square, W.*

Year of Election.	
1867	Andrews, G. H., Esq. *The Cedars, New Brentford.*
1866	Andrews, John R., Esq. 14, *Bryanston-square, W.*
1875	Andrews, Thomas R., Esq., J.P. 4, *Cumberland-place, Regent's-park, N.W.*
1877	Andrews, Wm., Esq., C.E. 2, *Merton-villas, Queen's-road, Richmond.*
1868	Angas, George F., Esq. 48, *Norland-square, Holland-park, W.*
1873	Angelo, Hy. Cavendish A., Esq., *Asuncion, Paraguay.*
1875	Augier, F. J., Esq. 79, *Gracechurch-street, E.C.*
1861	Ansell, Maurice, Esq. *Hanover Square Club, Hanover-square, W.*
1853	Ansted, Prof. D. T., M.A., F.R.S., &c. 4, *Westminster-chambers, S.W.; and Athenæum Club, S.W.*
1873	70 Anstey, George A., Esq. *Windham Club, S.W.*
1857	Anstruther, Major-General Philip, C.B., Madras Artillery. *Airth-castle, by Falkirk, N.B.*
1864	Anstruther, Capt. R. L., Rifle Brigade. *Blue Gate, Ipswich.*
1874	*Antrim, Wm. Randal McDonnell, Earl of. *Glenarm-castle, Larne, Co. Antrim.*
1868	Arbuthnot, George, Esq. 23, *Hyde-park-gardens, W.*
1862	Arbuthnot, Major George, R.H.A. *Cowarth, Sunningdale.*
1876	Arbuthnot, Hugh L., Esq. 69, *Eaton-square, S.W.*
1872	Archibald, Wm. Fredk. A., Esq. 3, *Amersham-road, Putney, S.W.*
1870	Ardagh, Capt. John C., R.E. *Junior United Service Club, Charles-street, S.W.*
1855	*Arden, Richard Edward, Esq. *East Burnham-house, Buckinghamshire.*
1858	80*Armistead, Rev. Charles John, M.A., F.S.A. *United University Club, S.W.*
1863	Armitage, Edward, Esq. 3, *Hall-road, St. John's-wood, N.W.*
1867	*Armitstead, George, Esq., M.P. *Errol-park, Errol, N.B.*
1857	Armstrong, Sir Alexander, K.C.B., LL.D., F.R.S., Director-General of the Navy Medical Department. *Admiralty, Somerset-house, W.C.; and Junior United Service Club, S.W.*
1875	Arnold, Edwin, Esq., C.S.I. *'Daily Telegraph' Office, Fleet-street, E.C.*
1875	Arnot, Hon. David. *Eskdale, Albania, Griqualand West, Cape of Good Hope.*
1876	Arnott, Thos. R., Esq. 38A, *King William-street, E.C.*
1876	Arrowsmith, R., Esq., Government Inspector of Mines. *Chiltern, Victoria, Australia.*
1873	Arthur, Colonel Sir Frederick, Bart. 24, *Queen's-gate, South Kensington, S.W.*
1863	Arthur, Captain William, R.N. *H.M.S. "Vernon," Portsmouth.*
1872	90 Artingstall, M. Geo., Esq., J.P. *Latchford-house, Warrington.*
1869	Ashbee, Edmund Wm., Esq., F.S.A. 17, *Mornington-crescent, Regent's-park, N.W.*
1870	*Ashton, Charles, Esq. *Delrow, Watford.*
1864	*Ashton, R. J., Esq. *Crown-court, Old Broad-street, E.C.*
1873	*Ashton, Captain Samuel Tudor. 7, *Palmeira-square, Brighton.*
1853	*Ashwell, James, Esq., M.A., F.G.S. 11, *Brock-street, Bath.*
1830	*Atkins, John Pelly, Esq., F.S.A. *Halsted-place, near Sevenoaks.*
1875	Atkinson, Alatau, Esq.
1876	Atkinson, E. T.
1870	Atkinson, William, Esq., F.L.S., &c. 47, *Gordon-square, W.C.*

Year of Election.		
1869	100	Atlee, Charles, Esq. *The Park, Ealing, W.*
1860		Attwell, Professor Henry. *Barnes, S.W.*
1859		Austen, Major Henry H. Godwin (24th Foot, Bengal Staff Corps). *Junior United Service Club, S.W.; and Shalford-house, near Guildford, Surrey.*
1863		Austin, John G., Esq. *Care of the Colonial Company, 16, Leadenhall-street, E.C.*
1854		Ayrton, Right Hon. Acton S. 11, *Bolton-street, Piccadilly.*
1874		Baber, E. Colborne, Esq., H.M. Consular Service, *China. Care of Foreign-office, S.W.*
1866		*Babington, William, Esq. *St. Kilda, Buckhurst-hill, Essex.*
1836		*Back, Admiral Sir Geo., D.C.L., F.R.S. 109, *Gloucester-place, Portman-sq., W.*
1875		*Backler, Hy. McL., Esq. *Vernon-house, Lordship-lane, Dulwich, S.E.*
1866		*Bacon, Geo. Washington, Esq. 127, *Strand, W.C.*
1873	110	Baden-Powell, Henry W. S., Esq. 1, *Hyde-park-gate South, S.W.*
1864		Badger, Rev. Geo. P. 21, *Leamington-road-villas, Westbourne-park, W.*
1873		Bagge, Sir William, Bt., M.P. *Stradsett-hall, Market Downham, Norfolk.*
1863		Bagot, Christopher N., Esq. *Oriental Club, W.*
1859		Bailey, Staff Commander L. C., R.N. *Topographical Department, Adair-house, St. James's-square, S.W.*
1857		Baillie, Major-General John (Bengal Staff Corps). 25, *Hamilton-terrace, St. John's-wood, N.W.*
1872		Baillie, Capt. Wm. Hunter. 43, *Norfolk-square, W.*
1875		*Bain, Hon. James. 2, *Park-terrace, Glasgow.*
1874		Bainbridge, Jno. Hugh, Esq. *Frankfield, Cork, Ireland.*
1873		Baines, W. Mortimer, Esq. *Bell-hall, York.*
1875	120	*Baker, George, Esq. 66, *Mark-lane, E.C.; and Snaresbrook.*
1861		*Baker, John, Esq.
1862		Baker, Captain Robert B. *Oriental Club, Hanover-square, W.*
1865		Baker, Sir Sam. White, Pasha, F.R.S. *Sandford Orleigh, nr. Newton Abbot, Devon.*
1871		Baker, T. B., Esq., C.B. *Wickham-park-terrace, Lewisham.*
1876		Baker, Colonel T. D., C.B. *Army and Navy Club, Pall Mall, S.W.*
1855		*Baker, Major W. T. *Junior United Service Club, S.W.*
1873		Baker-Cresswell, Lieutenant G. George. *Cresswell, Morpeth.*
1861		Balfour, Colonel David. *Balfour-castle, Kirkwall, N.B.*
1847		Balfour, Lieut.-Gen. Sir George, K.C.B., R.A., M.P. 6, *Cleveland-gardens, Hyde-park, W.; and Oriental Club, Hanover-square, W.*
1870	130	Balfour, Captain George M., R.N.
1853		Balfour, John, Esq. 13, *Queen's-gate-place, S.W.*
1876		Balfour, T. H., Esq. *Shanghai.*
1876		Ball, Arthur Edmund, Esq. *Stanhope-villa, Charlwood-road, Putney, S.W.*
1860		Ball, John, Esq., F.R.S. 10, *Southwell-gardens, South Kensington.*
1876		Ball, John B., Esq. 7, *Holtham-villas-road, Putney, S.W.*
1872		Balls, W. H., Esq. 3, *The Terrace, Kennington-park, S.E.*

Year of Election.		
1852		Bancroft, Col. W. C., 16th Regt. *Care of Sir C. M'Gregor and Co., Charles-street, S. W.*
1873		Bandini, His Highness Prince Giustiniani. *Rome. Care of Messrs. Baring Brothers and Co., 8, Bishopsgate-street-within, E.C.*
1875		Bannatyne, Neil, Esq. 4, *Earl's-court-square, South Kensington.*
1858	140	Bannerman, Sir Alexander, Bart. 46, *Grosvenor-place, S.W.*
1872		Barber, Wm. Cambridge, Esq. *Crossley Orphan Home and School, Savile-park, Halifax.*
1874		Barbour, W. Boyle, Esq. *Springvale, Hilton-lane, Prestwich, near Manchester.*
1869		Barchard, Francis, Esq. *Horsted-place, Uckfield.*
1873		Barclay, Hugh G., Esq. *Monkhams, Woodford, Essex.*
1870		Barclay, Wm. L., Esq., B.A. *Leyton, Essex.*
1863		Barford, A. H., Esq., M.A. 1, *Cornwall-terrace, Regent's-park, N.W.*
1835		*Baring, John, Esq. *Oakwood, Chichester.*
1870		Barkly, Sir Henry, K.C.B., Governor of the Cape of Good Hope.
1862		Barlee, Frederick Palgrave, Esq. (Governor of British Honduras). *Care of G. Lawrence, Esq., 12, Marlborough-road, Lee, S.E.*
1868	150	Barlow, Frederick Thomas Pratt, Esq. 26, *Rutland-gate, S.W.*
1871		Barnes, Robert, Esq., M.D. 31, *Grosvenor-street, W.*
1872		Barnett, Edward Wm., Esq.
1867		*Barns, John W., Esq. *Bhawulpore, Punjaub, India; care of Messrs. Grindlay, 55, Parliament-street, S.W.*
1870		Barr, Edward G., Esq. 76, *Holland-park, W.; and* 36, *Mark-lane, E.C.*
1873		Barrett, Benjamin, Esq. *Albert-cottage, Framlingham, Suffolk.*
1875		Barrett, Howard, Esq., M.R.C.S. 3, *Tavistock-square, W.C.*
1859		Barrington, George, Viscount, M.P. 19, *Hertford-street, W.*
1867		*Barrington Ward, Mark J., Esq., B.A., F.L.S. (Her Majesty's Inspector of Schools). *St. Winifred's, Lincoln; and United University Club, S.W.*
1833		Barrow, John, Esq., F.R.S., F.S.A. 17, *Hanover-terrace, Regent's-park, N.W.*
1877	160	Barrow, Reuben Vincent, Esq. *Sydney-lodge, Croydon.*
1863		Barry, Alfred, Esq. *Mayfield, Shortlands, Kent.*
1857		Bartholomew, John, Esq. 17, *Chambers'-street, Edinburgh.*
1862		Barton, Alfred, Esq., M.D. *Oriental Club, W.*
1874		Barton, Dr. Geo. Kingston. *Buckhurst-hill, Essex.*
1837		*Bateman, James, Esq., F.R.S., F.L.S. 9, *Hyde-park-gate South, S.W.*
1876		Bateman, John, Esq. *Great Bromley-lodge, Colchester.*
1859		Bateman, John F., Esq., C.E., F.R.S. 16, *Great George-street, Westminster, S.W.*
1873		Bates, General Henry, C.B. 2, *Sussex-place, Hyde-park, W.*
1875		Bates, Major, C.E. *Care of Messrs. Grindlay and Co., 55, Parliament-street, S.W.*
1866	170	Bateson, George, Esq. *Heslington-hall, York.*
1873		Batten, Henry Howard, Esq. 21, *St. George's-square, S.W.; and Junior Carlton Club, Pall-mall, S.W.*
1866		Batten, John H., Esq. 5, *Mansten-terrace, Heavitree, Exeter.*

Year of Election		
1872		Battiscombe, Major Wm. Benj. *Naval and Military Club, Piccadilly.*
1858		Baxendale, Joseph H., Esq. *Worplesdon, Guildford.*
1867		Baxter, Richard, Esq., Barrister-at-Law. 32, *Leinster-gardens, Bayswater, W.*
1863		Bayley, H., Esq. *Peninsular and Oriental Co., Leadenhall-street, E.C.*
1873		*Baylis, Capt. E. W. D. *Penally, Tenby, South Wales.*
1862		Bayly, Lieut.-Col. John, R.E. *Ordnance Survey Office, Southampton.*
1872		*Baynes, A. Henry, Esq. 19, *Castle-street, Holborn, E.C.*
1862	180	Baynes, Lieut.-Col. R. Stuart. *Army and Navy Club, S.W.*; and 38, *Jermyn-street, S.W.*
1872		*Baynes, Wm. Wilberforce, Esq., D.L. *Campbelton House, Croydon.*
1868		Baynton, Captain Edward. *Trafalgar-lodge, Shirley, Southampton.*
1874		Beach, W. J., Esq. 24, *Fenchurch-street, E.C.*
1871		Beadon, Sir Cecil, K.C.S.I. *Cheltenham; and* 15, *Elvaston-pl., S. Kensington, S.W.*
1874		Beall, Geo., Esq., Secretary Local Marine Board. *Liverpool.*
1874		Beardmore, Nathaniel St. B., Esq. 30, *Great George-street, S.W.*
1872		Beaton, Capt. John. 13, *Palace-gardens-terrace, W.*
1854		*Beaufort, William Morris, Esq. (Bengal Civil Service). *Athenæum Club, S.W.*
1875		Beaumont, A. R. de, Esq. 19, *St. John's-park, Highgate, N.*
1856	190	Beaumont, John Aug., Esq. 81, *Lancaster-gate, W.; and Wimbledon-park-house, Wimbledon, S.W.*
1877		Beaumont, Commander Lewis A., R.N. 42, *Great Cumberland-place, W.*
1870		*Beaumont, Somerset, Esq. 23, *Park-street, Park-lane, W.*
1851		*Beaumont, Wentworth B., Esq., M.P. 144, *Piccadilly, W.; and Bretton-park, Wakefield.*
1872		Beavan, Lieut. Reginald. *Messrs. Grindlay and Co.*, 55, *Parliament-street, S.W.*
1867		*Beazeley, Michael, Esq., M.I.C.E. *Care of J. D. Campbell, Esq.*, 8, *Storey's-gate, S.W.*
1871		Beazley, Captain Geo. G., 83rd Regiment. *Army and Navy Club, S.W.*
1865		Bebb, Horatio, Esq. 13, *Gloucester-place, W.; and Leamington.*
1870		*Bective, Thomas, Earl of. 35, *Dover-street, W.; and Underley-hall, Kirkby Lonsdale, Westmoreland.*
1875		Bedbrook, W. H., Esq. *Blenheim-house, Wimbledon, S.W.*
1859	200	Bedford, Rear-Admiral G. Augustus. *South-view, Widmore-road, Bromley, Kent.*
1872		Bedwell, F. Le Breton, Esq. 3, *Avington-grove, Penge, S.E.*
1874		Beech, Geo. Müller, Esq. 83, *Park-street, Grosvenor-square, W.*
1870		*Beer, Julius, Esq. 56, *Portland-place, W.*
1875		Beesly, Edwd. Fras., Esq. 21, *Emmett-street, Queen's-road, Manchester.*
1868		Bedingfeld, Felix, Esq., C.M.G. 36, *Green-st., Park-lane; and Reform Club, S.W.*
1861		*Begbie, James, Esq. 2, *East-India-avenue, Leadenhall-street, E.C.*
1860		Begbie, Thomas Stirling, Esq. 4, *Mansion-house-place, E.C.*
1853		Belcher, Rev. Brymer. *St. Gabriel's, Pimlico, S.W.*
1858		Bell, C. Davidson, Esq., late Surveyor-General, Cape of Good Hope. 55, *Cadogan-place, S.W.*
1874	210	Bell, H. Douglas, Esq. 8, *Albion-terrace, Cleethorpes, Lincolnshire.*

Year of Election.		
1875		*Bell, Joshua P., Esq. 12, *Albemarle-street, W.*
1876		Bell, Thomas, Esq. 15, *Upper-park-road, Haverstock-hill, N.W.*
1868		Bell, Wm. A., Esq., B.A., M.D. *New University Club, St. James's-street, S.W.*
1871		Bell, Major W. M. *Belgrave-mansions, S.W.*
1874		Bell, William Moore, Esq. *Wigton, Cumberland.*
1864		Bellamy, Edward, Esq. 14, *Buckingham-street, Adelphi, W.C.*
1872		Bellville, Alfred, Esq. 20, *Penn-road-villas, Holloway, N.*
1863		Belmore, The Earl of. *Governor of New South Wales.*
1873		Benjamin, Horace B., Esq. 120, *New Bond-street, W.*
1870	220	Benjamin, Joseph, Esq. 112, *High Holborn, W.C.*
1875		Benke, Albert, Esq., M.A. 9, *Charles-street, St. James's, S.W.*
1857		Bennett, J. Risdon, Esq., M.D. 22, *Cavendish-square, W.*
1872		Bennie, A., Esq. 7, *Broad Sanctuary, Westminster, S.W.; and Oriental Club, W.*
1875		Benson, John, Esq. *Vernon-house, Gunnerside, Reeth, Yorkshire.*
1856		*Benson, William, Esq., Barrister-at-Law. *Langtons, Alresford, Hants.*
1830		Bentham, George, Esq., Pres. L.S. 25, *Wilton-place, S.W.*
1874		Bentinck, Major-General A. Cavendish. *East-court, Wokingham, Berks; and* 5, *Grosvenor-crescent, S.W.*
1868		Bentley, George, Esq. *Upton-park, Slough.*
1870		Benyon, Wm. H., Esq. *Spellow-hill, Boro'bridge, Yorkshire.*
1859	230	Berens, H. Hulse, Esq. *Sidcross, Foot's Cray, Kent.*
1865		Bernard, P. N., Esq. 37, *Connaught-square, Hyde-park, W.*
1876		Berryman, Edwin W., Esq. 32, *Great St. Helen's, E.C.*
1872		Berthon, Peter Hy., Esq. 20, *Margaret-street, Cavendish-square, W.*
1871		Best, Commr. Jno. Chas. *Plâs-yn-Vivod, Llangollen.*
1863		Best, William, Esq. *Kelstone, Millbrook, S. Hants.*
1867		Bethune, Alexander M., Esq. *Otterburn, Hamlet-road, Upper Norwood; and* 122, *Leadenhall-street, E.C.*
1842		*Bethune, Adm. C. R. Drinkwater, C.B. 4, *Cromwell-rd., S. Kensington, S.W.*
1836		Betts, John, Esq. 21, *Freegrove-road, Camden-road, N.*
1866		Bevan, William, Esq. 12, *Bolton-gardens, South Kensington, S.W.*
1876	240	Bevington, Henry Geo., Esq. *Ferndale-house, Lee, S.E.*
1876		Bevington, Herbert S., Esq., B.A. *Ferndale-house, Lee, S.E.*
1873		*Bibby, Edward, Esq. *Care of John Bibby, Esq., Hart-hill, Liverpool.*
1862		Bicker-Caarten, Peter, Esq. 30, *Northumberland-place, Bayswater, W.*
1875		Bickers, Edward, Esq., J.P. *Care of Messrs. King and Co., Cornhill, E.C.*
1876		Bickerstaff, W. M., Esq., J.P. 13, *Highbury-terrace, N.*
1871		Bickersteth, The Very Rev. Edward, D.D., Dean of Lichfield. *The Deanery, Lichfield.*
1868		*Bickmore, A. S., Esq., M.A., PH.D., Superintendent of the American Museum of Natural History. *Central-park, New York.*
1866		Bicknell, Algernon S., Esq. 23, *Onslow-gardens, South Kensington.*
1860		Bidder, G. Parker, Esq., C.E. 24, *Gt. George-st., S.W.; and Mitcham, Surrey.*
1871	250	Biddulph, Geo. Tournay, Esq. 43, *Charing-cross, S.W.*

Year of Election.		
1874		Biddulph, John, Esq. *Swansea.*
1869	250	Bidie, Geo., Esq., M.D., &c. *Bridge of Allan, N. B.*
1865		Bidwell, Charles Toll, Esq. *H.M. Consul, Balearic Islands. Care of H. J. Bidwell, Esq., Audit-office, Somerset-house, W.C.*
1859		Bigge, Frederick W., Esq. *Wavendon-house, Woburn.*
1868		Biggs, C. H. Walker, Esq. 2, *Alexandra-terrace, Reading.*
1876		Biggs, Jas., Esq., R.N. 15, *Thurloe-place, S. Kensington, S. W.*
1876		*Bigg-Wither, T. P., Esq., C.E. *Bellevue, Reigate.*
1850		Bigsby, John J., Esq., M.D., F.R.S. 89, *Gloucester-place, Portman-square, W.*
1860		Birch, H. W., Esq. *Belgrave-mansions, Grosvenor-gardens, S. W.*
1858	260	Birch, John William, Esq. 9D, *New Broad-street, E.C.; and* 27, *Cavendish-square, W.*
1862		*Birchill, Captain B. H. H. *Junior Carlton Club, S. W.*
1872		*Bird, Richard, Esq. *Wynyan-house, Fulham, S. W.*
1874		Birdwood, Geo., Esq., M.D. *India Museum, S. Kensington, S. W.; and Acton, W.*
1875		Birkbeck, Edw., Esq. *Horstead-hall, Norwich.*
1867		*Bischoffsheim, Henri Louis, Esq. 75, *South Audley-street, W.*
1858		Bishop, George, Esq., F.R.A.S. *Union Club, S. W.; and The Meadows, Twickenham, S. W.*
1861		Bishop, James, Esq. 11, *Portland-place, W.*
1876		Bishop, James, Esq. *Forest-row, Leytonstone.*
1870		Bishop, Wm. Henry, Esq. 8, *Prince of Wales-terrace, Kensington-palace, W.*
1867	270	Bisson, Capt. Frederick S. de Carteret, R.I.M. 70, *Berners-street, W.*
1870		Black, Andrew H., Esq. 23, *Royal-crescent, Glasgow.*
1860		*Black, Francis, Esq. 6, *North-bridge, Edinburgh.*
1876		Black, Maj.-Gen. Jas. 14, *St. James's-square, S. W.*
1867		Black, Thomas, Esq., Superintendent P. and O. Steam Navigation Company's Dockyard. *Oriental-place, Southampton.*
1870		Blackie, Thos. M., Esq., F.S.A. *Chipping-hill School, Witham, Essex.*
1849		Blackie, W. Graham, Esq., PH. DR. 17, *Stanhope-street, Glasgow.*
1871		Blackmore, W., Esq. *Founder's-court, Lothbury, E.C.*
1862		*Blackstone, Frederick Elliot, Esq., D.C.L. *British Museum, W.C.*
1873		Blagden, Robert, Esq. *Junior Carlton Club, Pall-mall, S. W.*
1869	280	Blaine, Henry, Esq. 2, *Cleveland-road, Castle-hill, Ealing, W.*
1874		Blair, Major H. F., R.E. 1, *Clarendon-place, Hyde-park-gardens, W.*
1865		Blake, Brig.-Gen. H. W. *Park-gate, near Battle, Sussex.*
1857		*Blake, Wollaston, Esq., F.R.S. 8, *Devonshire-place, W.*
1872		Blakemore, Ramsey, Esq. *Wimbledon, S. W.*
1861		*Blakeney, William, Esq., R.N. *Secretary to Hydrographic-office, S. W.*
1876		Blakeney, Captain W. A. F.
1868		Blakiston, Matthew, Esq. 18, *Wilton-crescent, S. W.*
1857		Blakiston, Captain Thomas, R.A. 18, *Wilton-crescent, S. W.*
1868		Blanc, Henry, Esq., M.D., &c. *Care of Messrs. H. S. King and Co.,* 45, *Pall-mall, S. W.*

Year of Election.	
1874	290 Blanch, Jno., Esq. *Care of W. H. Blanch, Esq.*, 11, *Denman-road, Peckham, S.E.*
1873	*Blanford, W. T., Esq., F.G.S. *Geological Survey-office, Calcutta. Care of Messrs. Trübner and Co., Ludgate-hill, E.C.*
1857	Blanshard, Richard, Esq. *Fairfield, Lymington, Hants.*
1839	*Blewitt, Octavian, Esq. 20, *John-street, Strand, W.C.*
1864	Blore, Edward, Esq., D.C.L., F.R.S., F.S.A., &c. 4, *Manchester-square, W.*
1875	Blount, Edward, Esq., C.B. 28, *Old Burlington-street, W.; and* 61, *Rue de Courcelles, Paris.*
1866	Blow, William Wootton, Esq. *Care of Robert Evans, Esq., Belvedere-park. Kent.*
1868	Blumberg, George F., Esq. *Mansfield-house, Clifton-gardens, Maida-vale, W.*
1872	*Blundell, Charles Weld, Esq. *Ince, Blundell-hall, Great Crosby; and Brookes's Club, S.W.*
1837	*Blunt, Jos., Esq.
1863	300*Blunt, Wilfred S., Esq. *Worth, Crawley, Sussex.*
1871	Blyth, Henry, Esq. 53, *Wimpole-street, W.*
1868	Blyth, Philip P., Esq. (J.P. for Middlesex). 53, *Wimpole-street, W.*
1871	*Bodenham, Chas de la Barre, Esq. *Rotherwas, Hereford,*
1858	Bohn, Henry G., Esq. 18, *Henrietta-street, Covent-garden, W.C.; and North-end-house, Twickenham.*
1874	Boileau, Colonel G. W. *Stanfield-hall, Wymondham.*
1862	Bolton, Major Francis John. 2, *Westminster-chambers, S.W.*
1861	Bompas, George Cox, Esq. 15, *Stanley-gardens, Kensington-park, W.*
1875	Bond, Henry, Esq. *Althorpe-house, Queen's-road, Richmond.*
1861	Bonney, Charles, Esq. *Adelaide, Australia.*
1858	310 Bonnor, George, Esq. 49, *Pall-mall, S.W.; and* 2, *Bayswater-terr., Kensington-square, W.*
1865	Bonwick, James, Esq. *St. Kilda, Melbourne. Care of W. Bedlow, Esq.*, 22, *South Audley-street, W.*
1872	Booker, Samuel, Esq. 47, *Albany, Old Hall-street, Liverpool.*
1866	Booker, Wm. Lane, Esq. *Care of Messrs. F. O'Brien and Co.*, 43, *Parliament-street, S.W.*
1876	Boor, Geo. C., Esq. *Leonard-house, Green-lanes, Stoke-Newington, N.*
1874	Booth, John, Esq. *Training College, Exeter.*
1875	Borlase, Capt. Jno. 6, *Priory-terrace, Hastings.*
1845	*Borrer, Dawson, Esq. *Altmont Ballon, Co. Carlow, Ireland.*
1856	*Botcherby, Blackett, Esq., M.A. 174, *Brompton-road, S.W.*
1875	Bourne, Geo., Esq. *Brisbane, Queensland. Care of Mr. John Taylor*, 110, *Fenchurch-street, E.C.*
1871	320 Bourne, John, Esq., C.E. 21, *Richmond-road, Bayswater, W.*
1874	Bourne, Robert, Esq., J.P. *Grafton-manor, Bromsgrove.*
1872	Bousfield, William, Esq., M.A. 33, *Stanhope-gardens, Queen's-gate, S.W.*
1860	Boustead, John, Esq. 34, *Craven-street, Strand, W.C.*
1866	*Boutcher, Emanuel, Esq. 12, *Oxford-square, Hyde-park, W.*
1865	Bouverie, P. P., Esq. 32, *Hill-street, Berkeley-square, W.*

Year of Election	
1876	Bowden, A., Esq. 390, *St. Vincent-street, Glasgow.*
1867	Bowell, Wm., Esq. *Chandos-house, Hereford; and Gate-house Grammar-school, Hereford.*
1861	*Bowen, Charles Christopher, Esq. *Christchurch, Canterbury, New Zealand. Care of A. O. Ottywell, Esq., 7, Westminster-chambers, S.W.*
1854	*Bowen, Sir George Ferguson, G.C.M.G., M.A., Governor of Victoria. *Care of Messrs. Cocks, Biddulph and Co., 43, Charing-cross, S.W.; and Athenæum Club, Pall Mall, S.W.*
1871	330*Bowers, Captain Alexander. *Care of Messrs. Fraser and Co., Penang.*
1871	Bowes, John, Esq. *Warrington, Lancashire.*
1862	Bowie, John, Esq. *Conservative Club, S.W.*
1869	Bowker, James Henry, Esq. *Basutoland, South Africa. Care of Messrs. King and Co., Cornhill, E.C.*
1868	Bowly, William, Esq. *Cirencester.*
1876	Bowman, Wm., Esq., F.R.S. 9, *Clifford-street, W.*
1865	Bowring, John Charles, Esq. *Forest-farm, Windsor Forest.*
1866	Bowring, Samuel, Esq. 1, *Westbourne-park, W.*
1868	Bowser, Alfred T., Esq. *Sunnyside, Kenninghall-road, Upper Clapton.*
1862	Boyce, Rev. W. B., Secretary to Wesleyan Missionary Society. *Wesleyan Mission-house, Bishopsgate-street, E.C.*
1845	340*Boyd, Edward Lennox, Esq., F.S.A. 35, *Cleveland-square, Hyde-park, W.*
1876	Boyd, Nelson, Esq. 8, *Queen Anne's-gate, S.W.*
1877	Boyd, Dr. R. *Southall-park, Middlesex.*
1874	Boyd, William, Esq., M.A., F.R.S.E., F.S.A., &c. *Peterhead, Aberdeenshire.*
1876	Boyer, George Phelps, Esq. 8, *Warwick-crescent, Maida-hill, W.*
1869	Boyle, Richard Vicars, Esq., C.S.I., Engineer in Chief to the Government Railways and Telegraph. *Japan. Care of Messrs. Grindlay and Co., 55, Parliament-street, S.W.*
1874	Boyson, Ambrose P., Esq. *East-hill, Wandsworth, S.W.*
1876	*Bradshaw, Surg.-Major A. F. *Simla, India.*
1870	*Bragge, William, Esq., C.E. *Shirle-hill, Sheffield.*
1862	Braithwaite, Isaac, Esq. 27, *Austin Friars, E.C.*
1863	350*Bramley-Moore, John, Esq. *Langley-lodge, Gerrard's-cross, Bucks.*
1859	*Brand, James, Esq. 109, *Fenchurch-street, E.C.*
1868	Brand, James Ainsworth, Esq. 12, *Hereford-gardens, Park-lane, W.*
1874	Brand, Jno. Hy., Esq. President of the Orange Free State Republic, S. Africa. *Care of Henry Blyth, Esq., 53, Wimpole-street, W.*
1872	Brander, Captain William M., 24th Foot.
1867	Brandis, Dr. D., F.L.S. *Director of Forests, Calcutta. Care of W. H. Allen, Esq., 13, Waterloo-place, S.W.*
1876	Brandon, David, Esq. 24, *Berkeley-square, W.*
1874	*Brandreth, Hy. P., Esq. *Standish-rectory, Wigan, Lancashire.*
1875	Branson, W. Powell, Esq. 23, *Rectory-grove, Clapham, S.W.; and 155, Fenchurch-street, E.C.*
1877	Brass, Emil, Esq. 9, *Grand Acre-terrace, South Penge-park, S.E.*

Year of Election.	
1871	360 *Brassey, Thomas, Esq., M.P. 24, *Park-lane, W.; and Normanhurst-court, Battle.*
1874	Bray, Joseph, Esq., C.E. 51, *Queen's-gate-gardens, S.W.*
1859	Braybrooke, Philip Watson. *Assistant Colonial Secretary, Ceylon. Messrs. Price and Co., Craven-street, W.C.*
1875	Brazza, Pierre Savorgnan de. *Paris.*
1874	Brent, Algernon, Esq. *Audit-office, Somerset-house, W.C.*
1834	*Breton, Commr. Wm. Henry, R.N., F.G.S. 15, *Camden-crescent, Bath; and The Rectory, Charmouth, Dorset.*
1862	Brett, Charles, Esq.
1876	Brett, Right Hon. Sir W. Baliol, Knt. 6, *Ennismore-gardens, Prince's-gate, S.W.*
1876	Bridal, Walter Geo., Esq. *Park-house Academy, Bromley.*
1867	Bridge, John, Esq. *Heatley-house, near Lymm, Cheshire.*
1874	370 Bridgeman, Granville, Esq. *Holme-lodge, Balham-road, Upper Tooting; and Junior Conservative Club, King-street, St. James's.*
1876	Bridger, R. Lowther, Esq. *New University Club, St. James's-street.*
1873	Bridger, Captain W. Milton, R.N. *Army and Navy Club, S.W.*
1858	Bridges, Nathaniel, Esq. *Blackheath-park, S.E.*
1852	*Brierly, Oswald W., Esq. 38, *Ampthill-square, N.W.*
1865	Briggs, Colonel J. P. *Bonjedward-house, Jedburgh.*
1861	*Bright, Sir Charles T., F.R.A.S. 11, *Delahay-street, Westminster, S.W.*
1868	Bright, Henry Arthur, Esq. *Ashfield, Knotty Ash, Liverpool.*
1860	Bright, James, Esq., M.D. 12, *Wellington-square, Cheltenham.*
1876	Bright-Smith, Rev. G. Aug. *Buscot-lodge, Maida-hill, W.*
1854	Brine, Colonel Frederic, R.E., K.T.S., Assoc. Inst. C.E., F.Z.S., Executive Engineer, Punjaub. *Army and Navy, Athenæum, R.A. and R.E., and United Service Clubs, S.W.; and Garrick Club, W.C.*
1856	380 Brine, Captain Lindesay, R.N. *Boldre-house, Lymington, Hants; and United Service Club, S.W.*
1861	Bristowe, Henry Fox, Esq. 6, *Chesham-place, S.W., and 22, Old-square, Lincoln's-inn, W.C.*
1875	*Broadmead, Jas., Esq., B.A. 20, *Davies-street, Berkeley-square; and Enmore-park, Bridgwater.*
1861	Brodie, Walter, Esq. *Orsett-house, Orsett-terrace, Hyde-park, W.*
1861	Brodie, William, Esq. *Eastbourne, Sussex.*
1874	Brodribb, William B., Esq. *The Bank of Australasia, Threadneedle-street, E.C.*
1863	*Brodrick, The Hon. George C. 32A, *Mount-street, W.*
1874	Brogden, James, Esq. 21, *Queen Anne-gate, Westminster, S.W.*
1876	Brooke, Commr. A. T., R.N. *Ashbrooke, Brooksboro', Lisnaskea, Ireland.*
1874	390 Brooke, Chas., Esq. (Rajah of Sarawak).
1864	*Brooke, Sir Victor A., Bart. *Colebrooke-park, Co. Fermanagh, Ireland.*
1875	Brooke, Capt. W. Saurin (Beng. Staff Corps).
1872	Brookes, Clifford J., Esq. *The Grange, Nightingale-lane, Clapham-common, S.W.*

Year of Election.		
1862		Brookes, Thomas, Esq. *Mattock-lane, Ealing, W.*
1856		*Brooking, George Thomas, Esq. 33, *Sussex-gardens, Hyde-park, W.*
1856		*Brooking, Marmaduke Hart, Esq. 11, *Montagu-place, Bryanston-square, W.*
1876		Brooks, Robert Alexander, Esq. *Conservative Club, St. James's-street, S.W.*
1870		*Brooks, Wm. Cunliffe, Esq., M.P., M.A., F.S.A., &c. 5, *Grosvenor-square, W.; Barlow-hall, near Manchester; and Forest of Glen-Tanar, Aboyne, Aberdeenshire.*
1863		*Broughall, William, Esq. *Broadwater, Down, Tunbridge-wells.*
1856	400	*Brown, Daniel, Esq.
1868		Brown, Colonel David (Madras Staff Corps). *India.*
1874		Brown, Rev. Dixon. 28, *Queen's-gate, S. Kensington, S.W.*
1877		Brown, E. A., Esq. *Burton-on-Trent.*
1877		Brown, Henry Rowland, Esq. 56, *Lincoln's-inn-fields, W.C.; and Oxley-grove, Stanmore.*
1860		Brown, James, Esq. *Rossington, Yorkshire.*
1874		Brown, J. B. Esq. 90, *Cannon-street, E.C.; and Bromley, Kent.*
1865		*Brown, James R., Esq., F.R.S.N.A., Copenhagen. 84, *Caversham-road, N.W.*
1861		*Brown, John Allen, Esq. *Dahlwell-lodge, Kent-gardens, Ealing, W.*
1867		Brown, Richard, Esq., C.E. 115, *Lansdowne-road, Notting-hill, W.*
1867	410	Brown, Robert, Esq., M.A., Dr. Phil., F.L.S., &c. 26, *Guilford-road, Albert-square, S.W.*
1858		*Brown, Thomas, Esq. 8, *Hyde-park-terrace, Hyde-park, W.*
1876		*Brown, Rev. Thos. E. *Clifton-college, Bristol.*
1859		Brown, William, Esq. *Quarry-hill-house, Tonbridge, Kent.*
1863		Browne, H. H., Esq. *Moor-close, Binfield, Bracknell.*
1858		*Browne, John H., Esq. *Glenlus, Bays-hill, Cheltenham.*
1869		Browne, Samuel Woolcott, Esq. 58, *Porchester-terrace, Hyde-park, W.*
1864		*Browne, Captain Wade. 35, *Charles-street, Berkeley-square, W.*
1874		Browne, Walter Raleigh, Esq., C.E. *Savile Club,* 15, *Savile-row, W.*
1870		Browne, Wm. A. Morgan, Esq. 116, *Piccadilly, W.*
1858	420	Browne, William J., Esq. *Merly-house, Wimborne, Dorsetshire.*
1869		Browning, G. F., Esq. 25, *Longton-grove, Sydenham.*
1852		Browning, H., Esq. 73, *Grosvenor-street, Grosvenor-square, W.; and Old Warden-park, Biggleswade.*
1856		*Browning, Thomas, Esq. 6, *Whitehall, S.W.*
1863		Brunton, John, Esq., M.I.C.E., F.G.S. 13A, *Great George-street, S.W.*
1873		Brunton, R. H., Esq., F.G.S., &c. 1, *Oxford-villas, Balham, S.W.*
1856		Bryant, Walter, Esq., M.D., F.R.C.S. 23A, *Sussex-square, Hyde-park-gardens, W.*
1867		*Buccleuch, His Grace the Duke of, K.G., F.R.S. *Dalkeith-palace, near Edinburgh; and Montagu-house, Whitehall, S.W.*
1875		Buchanan, Andrew, Esq., M.D. 48, *Eastbourne-terrace, Hyde-park, W.*
1874		Buchanan, R. Dunlop, Esq. 16, *Porchester-terrace, W.*
1874	430	*Buchanan, Thos. Ryburn, Esq. *All Souls' College, Oxford.*

Year of Election.		
1875		Buckley, Frank, Esq. *Liverpool-road, Birkdale.*
1869		Buckley, John, Esq. *Care of Messrs. Dalgety, Du Croz, and Co.*, 52, *Lombard-street, E.C.*
1876		Buckley, John, Esq. *The Academy, Weaver-view, Winsford, Cheshire.*
1863		Budd, J. Palmer, Esq. *Ynisdaren, near Swansea.*
1867		*Bulger, Lieut.-Colonel George Ernest, F.L.S., F.M.S., C.M.Z.S., &c., late 10th Foot. *Care of Messrs. Wheatley and Co.*, 156, *Leadenhall-street, E.C.*
1868		*Bull, William, Esq., F.L.S. *King's-road, Chelsea, S.W.*
1865		Buller, Sir Edward M., Bart., M.P. *Old Palace-yard, S.W.; and Dilhorn-hall, Cheadle, Staffordshire.*
1869		Buller, Walter L., Esq., F.L.S. 7, *Westminster-chambers, Victoria-st., S.W.*
1875		Bullinger, Rev. E. Wm. *Walthamstow, Essex.*
1863	440	Bullock, Captain Charles J., R.N. *Hydrographic-office, S.W.*
1875		Bullock, Rev. Wm. T., M.A. *Kensington Palace, W.*
1860		*Bunbury, Sir Charles James Fox, Bart., F.R.S. *Barton-hall, Bury St. Edmund's.*
1839		Bunbury, E. H., Esq., M.A. 35, *St. James's-street, S.W.*
1863		Bundock, F., Esq. *Buckland-abbey, Horrabridge, S. Devon.*
1861		Burges, William, Esq. *Fethard, Co. Tipperary.*
1866		*Burgess, James, Esq., M.R.A.S., Archæological Reporter, &c., to Government. *Bombay.* 8, *Merchiston-terrace, Edinburgh. Care of Messrs. Trübner, Ludgate-hill, E.C.*
1875		Burgoyne, John, Esq. *Wood-thorpe, Stone-bridge-park, Willesden.*
1871		*Burke, Samuel Constantine, Esq. 84, *Harbour-street, Kingston, Jamaica.*
1864		Burn-Blyth, Robert, Esq. 5, *Clifton-place, Sussex-square, W.*
1872	450	Burne, Lieut.-Colonel O. F. *India-office, S.W.*
1871		Burney, Commr. Chas., R.N., *Superintendent Greenwich Hospital Schools, S.E.*
1863		*Burns, John, Esq. *Castle Wemyss, by Greenock, N.B.*
1861		*Burr, Higford, Esq. 23, *Eaton-place, S.W.; and Aldermaston-court, Berkshire.*
1857		Burstal, Captain E., R.N. 9, *Park-villas, Lower Norwood, S.E.*
1872		Burt, Charles, Esq. *Hill-side-house, Richmond, Surrey.*
1830		*Burton, Alfred, Esq. 64, *Marina, St. Leonard's.*
1833		*Burton, Decimus, Esq., F.R.S. 1, *Gloucester-houses, Gloucester-crescent, W.*
1859		*Burton, Capt. Richd. Fras. *Athenæum Club;* 14, *Montagu-place, Montagu-square, W. Care of Messrs. O'Brien and Co., Parliament-street, S.W.*
1869		Burton, William Samuel, Esq. *South-villa, Regent's-park, N.W.*
1858	460	Bury, Wm. Coutts, Viscount, K.C.M.G. 65, *Prince's-gate, S.W.*
1861		Bush, Rev. Robert Wheler, M.A. 29, *Milner-square, Islington, N.*
1874		Bushell, Dr. Nathaniel. *Prince's-park-school, Liverpool.*
1874		Bushell, Dr. S. W., M.D. *Poulton, Wingham, Kent.*
1873		Busk, Capt. Hans, D.L., LL.D., F.R.S., Hon. D.C.L. Oxford. 21, *Ashley-place, S.W.; and United University Club.*
1868		Busk, William, Esq., M.C.P., &c. 28, *Bessborough-gardens, S.W.*
1861		Butler, Charles, Esq. 3, *Connaught-place, Hyde-park, W.*
1867		Butler, E. Dundas, Esq. *Geographical Department, British Museum, W.C.*

Year of Election.		
1860		Butler, Rev. Thomas. *Wilderhope-house, Shrewsbury.*
1871		Butler, Major W. F. (69th Regiment). *Horse Guards, S.W.*
1870	470	Butter, Donald, Esq., M.D., &c., Inspector-General of Hospitals, Bengal, retired. *Hazelwood, Church-road, Upper Norwood, S.E.*
1870		Buxton, Francis W., Esq., B.A. 15, *Eaton-place, S.W.*
1869		Buxton, Henry Edmund, Esq., B.A. *Bank-house, Great Yarmouth, Norfolk.*
1873		Buxton, John H., Esq. *Brewery, Spitalfields, E.C.*
1858		*Buxton, Sir Thomas Fowell, Bart. 14, *Grosvenor-crescent, S.W.; and Warlies, Waltham-abbey, Essex.*
1873		Bykovski, Gryf Jaxa, Esq. *Gryf Park, Viesna Bojanov, near Bobruish, Russia.*
		C
1861		Calthorpe, The Hon. Augustus Gough. 63, *Rutland-gate, S.W.*
1855		*Calthorpe, F. H. Gough, Lord. 33, *Grosvenor-square, W.*
1854		Calvert, Frederic, Esq., Q.C. 38, *Upper Grosvenor-street, W.*
1871		*Cama, Dorabjee Pestronjee, Esq. 3 *and* 4, *Winchester-street-buildings, E.C.*
1861	480	Cameron, Donald, Esq., M.P. *Auchnacarry, Inverness-shire.*
1872		Cameron, Major Donald R., R.A. *Malta.*
1858		Cameron, Lieut.-General Sir Duncan Alexander, G.C.B. *Governor Royal Military College, Sandhurst, Berks.*
1873		Cameron, Henry Lovett, Esq. 25, *Granville-place, Portman-square, W.*
1864		Cameron, J., Esq. 32, *Great St. Helen's, E.C.*
1866		Cameron, R. W., Esq. *P.O. Box* 1676, *New York. Care of Messrs. Brooks and Co., St. Peter's-chambers, Cornhill, E.C.*
1876		Cameron, Commr. Verney Lovett, R.N., C.B. 25, *Granville-pl., Portman-sq., W.*
1871		*Campbell, Allan, Esq. *Melbourne Club, Melbourne.*
1873		Campbell, C. H., Esq. 10 *Eaton-place, S.W.*
1866		Campbell, Sir George, K.C.S.I., M.P., D.C.L. 13, *Cornwall-gardens, South Kensington, S.W.; and Athenæum Club, S.W.*
1844	490	*Campbell, James, Esq. *Park-farm, Hendon, Middlesex; and* 37, *Seymour-street, W.*
1857		Campbell, James, Esq., Surgeon R.N. *The Grange, Chigwell-row, N.E.*
1834		*Campbell, James, Esq., jun. *Cawley Priory, Chichester.*
1863		*Campbell, James Duncan, Esq. *Peking.* 8, *Storey's-gate, St. James's-park, S.W.*
1869		Campbell, Robert, Esq., J.P. 31, *Lowndes-square, S.W.; and Buscot-park, Lechlade, Gloucestershire.*
1872		Campbell, Robert, Esq. *Lednock-bank, Comrie, Perthshire.*
1872		Campbell, William, Esq. *New Club, Glasgow.*
1856		Campbell-Johnston, A. R., Esq., F.R.S. 84, *St. George's-square, S.W.*
1876		Campion, Frank, Esq. *The Mount, Duffield-road, Derby.*
1876		Candler, Samuel Horace, Esq. 23, *Essex-street, Strand, W.C.*
1866	500	Canning, Sir Samuel, C.E. *The Manor-house, Abbots Langley, near Watford, Herts.*
1864		*Cannon, John Wm., Esq. *Castle-grove, Tuam.*

Year of Election.		
1857		Cannon, Lieut.-General R. 5, *Park-villas, Folkestone.*
1873		*Cardwell, Edward H., Esq. *Hillside, West Horsley, Surrey; Oxford and Cambridge and Garrick Clubs.*
1853		*Cardwell, Viscount. 74, *Eaton-square, S.W.*
1863		*Carew, R. Russell, Esq., J.P. *Carpenders-park, Watford, Herts; and Oriental Club, W.*
1873		Carey, Lieutenant H. C. (late I.N.). *Alma-road, Southport.*
1869		Carey, Rev. Tupper. *Fifield, Bavant, Salisbury; and* 15, *Hyde-park-gardens, W*
1872		Carfrae, John, Esq. 31, *St. Swithin's-lane, E.C.; and Junior Conservative Club, King-street, St. James's.*
1862		Cargill, John, Esq., Member of the Legislative Assembly of New Zealand and Legislative Council of Otago. *Dunedin, Otago, New Zealand. Care of Messrs. Cargill, Joachim and Co.,* 28, *Cornhill, E.C.*
1863	510	*Cargill, Wm. W., Esq.
1873		*Carillon, John Wilson, Esq., F.S.A., F.S.S., &c. *Wormhill, Buxton.*
1858		Carlingford, Lord. 7, *Carlton-gardens, S.W.*
1876		Carlisle, A. D., Esq. *Haileybury-college, Hertford.*
1864		*Carmichael, Capt. L. M., M.A. (5th Lancers). *Oxford and Cambridge Club, S.W.*
1865		*Carnegie, David, Esq. *Eastbury, by Watford, Herts.*
1863		Carnegie, Commander the Hon. J., R.N. 26, *Pall-mall, S.W.*
1874		Carnegie, Patrick, Esq. *Hazlewood, Upper Norwood.*
1869		Carr, William, Esq. *Dene-park, near Tunbridge.*
1876		*Carr, Wm. Ward, Esq., M.D. *Leyland-villa, Eltham-road, Lee, S.E.*
1861	520	Carter, Lieut.-Colonel Hugh Bonham- (Coldstream Guards). *Guards' Club, S.W. and* 1, *Carlisle-place, Victoria-street, S.W.*
1868		Carter, Captain Thomas Tupper, R.E. *Care of Messrs. H. S. King and Co.,* 45, *Pall-mall.*
1873		Carter, Theodore, Esq. 10, *Hanover-street, Rye-lane, S.E.*
1857		Cartwright, Col. Henry (Grenadier Guards), M.P. *Eydon-hall, Banbury.*
1874		Cartwright, William, Esq. *Care of Office of Chinese Customs,* 8, *Storey's-gate, St. James's-park, S.W.*
1860		*Carver, Rev. Alfred J., D.D., Master of Dulwich College. *Dulwich, S.E.*
1869		Casberd-Boteler, Commr. W. J., R.N. *The Elms, Taplow; and Naval and Military Club, Piccadilly, W.*
1858		Casella, Louis P., Esq. 147, *Holborn-bars, E.C.; and South-grove, Highgate, N.*
1875		Cassels, Andrew, Esq. (Member of Council of India). 51, *Cleveland-square, Westbourne-terrace, W.*
1874		Cassiani, Chas. Joseph, Esq. 12, *George-street, Portman-square, W.*
1873	530	Cathcart, Major Andrew. 16, *Grosvenor-street, W.*
1872		Caton, R. Redmond, Esq., F.S.A. *Union Club; and Binbrook-house, Market-manor, Lincolnshire.*
1872		Cattley, Edward, Esq. 34, *Woburn-square; and St. Petersburg.*
1860		Cave, Amos, Esq. *Grove-house, Belvedere, Kent.*
1876		Cave, Colonel Edward. *East India United Service Club,* 14, *St. James's-square, S.W.*

Year of Election.	
1857	Cave, Captain Laurence Trent. 75, *Chester-square, S.W.*
1858	Cave, Right Hon. Stephen, M.P. 35, *Wilton-place, S.W.*
1874	Cave-Browne, Rev. J. *Vicar of Detling, Maidstone.*
1869	Cayley, Dr. Henry.
1873	Chadwick, Jesse, Esq. *London-road, Derby.*
1874	540 Chadwick, Jno. O., Esq. 46, *Bolton-road, St. John's-wood, N.W.*
1863	Challis, John Henry, Esq. *Reform Club, S.W.*
1871	*Chalmer, Capt. Reginald (60th Royal Rifles). *Peshawur, East Indies.*
1874	Champain, Major J. U. Bateman, R.E. *Chisholm-lodge, Queen's-road, Richmond.*
1858	Champion, John Francis, Esq. *High-street, Shrewsbury.*
1876	Champney, Chas. E., Esq. *Bank Field, Halifax.*
1866	*Chandless, William, Esq. 5, *Portman-street, Oxford-street, W.*
1875	Chapelle, Count de la. 4, *Jermyn-street, St. James's, S.W.*
1870	Chapman, Capt. E. F., R.A. *Fairholme, Wimbledon, S.W.*
1863	*Chapman, Spencer, Esq. *Roehampton, S.W.*
1870	550 Charles, Rev. D., B.A. (Oxon), D.D. *Aberdovey, North Wales.*
1861	Charnock, Richard Stephen, Esq., PH.DR., F.S.A. *Junior Garrick Club, Adelphi-terrace, W.C.*
1875	Chater, Geo., junr., Esq. 41, *Porchester-square, Hyde-park, W.*
1872	Chatwood, Samuel, Esq. 5, *Wentworth-place, Bolton.*
1873	Chauntrell, Fred Dundas, Esq. 63, *Lincoln's-inn-fields, W.C.*
1876	Chauvin, George von, Esq. 6, *Half-moon-street, W.*
1864	*Cheadle, Walter B., Esq., B.A., M.D. Camb. 2, *Hyde-park-place, Cumberland-gate, W.*
1873	Cheetham, Samuel, Esq. 11, *Rumford-place, Liverpool.*
1855	Cheshire, Edward, Esq. 3, *Vanbrugh-park, Blackheath, S.E.; and Conservative Club, S.W.*
1858	Chetwode, Augustus L., Esq. 3, *Charles-street, Lowndes-square, S.W.; and Chilton-house, Thame, Oxfordshire.*
1876	560 Cheyne, Captain Jno. P., R.N. 15, *Addison-gardens, North, Kensington, W.*
1870	Chichester, Sir Bruce, Bart. *Arlington-court, Barnstaple.*
1858	Childers, Right Hon. Hugh C. E., M.P. 17, *Prince's-gardens, W.*
1856	Childers, John Walbanke, Esq. *Cantley-hall, near Doncaster.*
1857	*Chimmo, Captain William, R.N. *Westdowne, Weymouth.*
1869	Chinnock, Frederick George, Esq. 86, *Cornwall-gardens, Queen's-gate, S.W.*
1874	*Cholmley, Harry Walter, Esq. *Howsham, near York.*
1872	Christie, James Alexander, Esq. *Flushing, Falmouth.*
1872	Christie, T. Beath, Esq., M.D. *Ealing.*
1871	Church, Colonel Geo. Earl. 19, *Great Winchester-street, E.C.*
1830	570 *Church, W. H., Esq.
1849	Churchill, Lord Alfred Spencer. 16, *Rutland-gate, S.W.*
1856	Churchill, Charles, Esq. *Weybridge-park, Surrey.*
1870	Clapton, Edward, Esq., M.D., &c. *St. Thomas's-street, Southwark, S.E.*

Year of Election.	
1863	Clark, Lieut. Alex. J. 14, *St. James's-square, S.W.*
1870	Clark, Charles, Esq. 20, *Belmont-park, Lee, Kent, S.E.*
1872	Clark, George Thomas, Esq. *Dowlais-house, Dowlais.*
1873	Clark, Sir John, Bart. 38, *Cornwall-gardens, S.W.; and Tillypronie, Aboyne, Aberdeenshire.*
1868	Clark, John Gilchrist, Esq. *Speddock, Dumfries, Dumfriesshire.*
1862	Clark, J. Latimer, Esq. 5, *Westminster-chambers, Victoria-street, S.W.; and Beechmont, Dulwich, S.E.*
1874	580 *Clark, Mathew E., Esq. 18, *Granville-place, Portman-square, W.*
1870	Clark, Robert, Esq. 46, *Chepstow-villas, Bayswater, W.*
1868	Clark, William, Esq. *The Cedars, South Norwood.*
1859	Clark, Rev. W. Geo., M.A. *Trinity College, Cambridge.*
1865	Clark, W. H., Esq. 6, *Leinster-terrace, Hyde-park, W.*
1874	*Clark-Kennedy, Capt. Alexander W. M., F.Z.S. (late Coldstream Guards). *Craig's-house, Dumfries, N.B.; and Guards' Club, Pall-mall, S.W.*
1875	Clarke, Archibald Hy., Esq. *South-hill, Paignton, Devon.*
1859	Clarke, Col. A., R.E. *Army and Navy Club, S.W.*
1874	Clarke, Captain F. C. H., R.A. *Adair-house, St. James's-square, S.W.*
1872	Clarke, Joseph, Esq. *North-hill-villa, Highgate, N.*
1855	590 *Clarke, Rev. W. B., M.A. *Sydney, New South Wales. Care of Messrs. Trübner and Co., Ludgate-hill, E.C.*
1868	Clarke, W., Esq. 44, *Ladbroke-grove, W.*
1862	Claude, F. Eugène, Esq. *Alpina-house, Tufnell-park, N.*
1863	Clayton, Captain John W. (late 15th Hussars). 14, *Portman-square, W.*
1866	*Cleghorn, Hugh, Esq., M.D. *Stravithy, St. Andrew's.*
1871	Cleghorn, John, Esq., M.S.S., M.S.A., &c. 3, *Spring-gardens, S.W.*
1863	Clements, Rev. H. G. *United University Club, S.W.*
1870	Clements, Robert George, Esq. 97, *Victoria-park-road, E.*
1860	Clerk, Captain Claude. *Hyderabad, E. Indies.*
1858	Clermont, Thomas, Lord. 35, *Hill-street, Berkeley-square, W.; and Ravensdale-park, Newry.*
1845	600 *Cleveland, His Grace the Duke of. *Cleveland-house, 17, St. James's-square, S.W.*
1861	Clifford, Sir Charles. *Hatherton-hall, Cannock, Staffordshire.*
1858	Clifford, Charles Cavendish, Esq. *House of Lords, S.W.*
1871	Clifford, Henry, Esq., C.E. 1, *Lansdown-place, Blackheath, S.E.*
1866	Clinton, Lord Edward. *Army and Navy Club, S.W.*
1875	Clirehugh, W. P., Esq. 7, *Strathmore-gardens, Campden-hill, W.*
1856	Clive, Rev. Archer. *Whitfield, Hereford.*
1863	Clowes, E., Esq. *Salisbury-square, Fleet-street, E.C.*
1874	Clowes, Capt. Frederic (30th Regiment). *St. Mary's Barracks, Chatham.*
1854	Clowes, George, Esq. *Duke-street, Stamford-street, S.E.; Charing-cross, S.W.; and Surbiton, Surrey.*
1854	610 Clowes, William, Esq. *Duke-street, Stamford-street, S.E.; Charing-cross, S.W.; and 51, Gloucester-terrace, Hyde-park, W.*

Year of Election.	
1861	Clowes, William Charles Knight, Esq., M.A. *Duke-street, Stamford-street, S.E.; and Surbiton, Surrey.*
1874	Clutterbuck, Robert, Esq., J.P. 8, *Great Cumberland-place, W.*
1874	Coard, Philip Aldridge, Esq. 13, *St. Mark's-square, Sandringham-road, West Hackney, E.*
1877	Coate, James, Esq. 41 and 42, *Lisle-street, Leicester-square, W.C.; and Chard, Somersetshire.*
1875	Coates, Edmund, Esq. 8, *Baker-street, Portman-square, W.*
1875	Cobb, Jas. Francis, Esq. *The Brake, Torquay, Devon.*
1852	Cobbold, John Chevalier, Esq. *Athenæum Club, S. W.; and Ipswich, Suffolk.*
1859	Cochrane, Rear-Admiral the Hon. A., C.B. *Junior United Service Club, S. W.*
1873	*Cochrane, Kenneth, Esq. *Eknbank, Galashiels, N. B.*
1868	620 Cock, Edward, Esq. *Kingston-on-Thames.*
1869	*Cockburn, Captain James George, 6th Regiment. *Dover.*
1872	Cockburn, J. P., Esq. *The Mount, Totnes, South Devon.*
1862	Cockerton, Richard, Esq. *Cornwall-gardens, South Kensington, S. W.*
1862	*Cockle, Captain George. 9, *Bolton-gardens, South Kensington, S. W.*
1876	*Cocks, Alf. Heneage, Esq. 5, *Radnor-place, Gloucester-square, W.*
1859	Cocks, Colonel C. Lygon (Coldstream Guards). *Treverbyn-Vean, Liskeard, Cornwall.*
1865	Cocks, Major Octavius Yorke. 86, *Park-street, Grosvenor-square, W.*
1841	*Cocks, Reginald Thistlethwayte, Esq. 43, *Charing-cross, S. W.; and* 29, *Stanhope-gardens, South Kensington, S.W.*
1876	*Cocks, Thos. S. Vernon, Esq. 43, *Charing-cross, S. W.*
1871	630 *Cockshott, Arthur, Esq., M.A. *Eton College.*
1873	Codrington, General Sir William, G.C.B. 110, *Eaton-square, S.W.*
1872	*Coe, Rev. C. C. *Hyhfield, Bolton-le-Moors.*
1857	Coghlan, Edward, Esq. *Training-institution, Gray's-inn-road, W.C.*
1861	Coghlan, J., Esq., Engr.-in-Chief to the Government. *Buenos Ayres. Care of H. C. Forde, Esq.*, 6, *Duke-street, Adelphi, W.C.*
1876	*Coghlan, Nav. Lieut. Jas. E., R.N. *Care of Hydrographic-office, Admiralty, S.W.*
1862	Coghlan, Lieut.-Gen. Sir William M., K.C.B., R.A. *Ramsgate, Kent.*
1865	Colchester, Reginald Charles Edward, Lord. 68, *Eaton-place, S.W.*
1875	Cole, Geo. Ralph Fitz-Roy, Esq. *Queen Anne's-mansion, Westminster, S.W.; Wanderers', and South American Clubs, S.W.*
1868	Cole, William H., Esq. 64, *Portland-place, W.*
1876	640 Cole, Wm. Hammond, Esq. *Great Plumstead, near Norwich, Norfolk.*
1867	Colebrook, John, Esq. 1, *Walton-place, Chelsea, S.W.*
1841	*Colebrooke, Sir Thomas Edward, Bart., F.R.A.S. 37, *South-st., Park-lane, W.*
1854	Coleman, Everard Home, Esq., F.R.A.S. *Registry and Record Office,* 82, *Basinghall-street, E.C.*
1848	Coles, Charles, Esq. 86, *Great Tower-street, E.C.*
1876	Coles, James, Esq. 26, *Malvern-road, Beeston-hill, Leeds.*

Year of Election.	
1873	Coles, Jno., Esq. *Mitcham, Surrey.*
1835	*Collett, William Rickford, Esq. *Carlton Club, S.W.*
1872	Collingwood, Lieut. W. *India-office, S.W.*
1866	Collinson, John, Esq., C.E. 37, *Porchester-terrace, Hyde-park, W.*
1855	650 Collinson, Vice-Admiral Sir Richard, K.C.B. *Haven-lodge, Ealing, W.; and United Service Club, S.W.*
1871	*Collis, Capt. Gustavus W. Berry, 6th Royal Regiment. *Care of Mrs. Collis, Barton-terrace, Dawlish, Devon.*
1875	Colls, Benjamin, Esq. *Sutton, Surrey.*
1862	Colquhoun, Sir Patrick M. de, Q.C., LL.D. 2, *King's-bench-walk, Temple, E.C.*
1869	Colvill, William H., Esq. (Surg. H.M. Ind. Army).
1861	*Colville, Charles John, Lord. 42, *Eaton-place, S.W.*
1865	Colvin, Binny J., Esq. 71, *Old Broad-street, E.C.*
1868	Colvin, Captain W. B., Royal Fusiliers.
1868	Combe, Lieut. B. A.
1871	Comber, Colonel A. K. (Dep.-Commd. of Assam, Goalpara). *Care of Messrs. Woodhead and Co., 44, Charing-cross, S.W.*
1864	660 Commerell, Admiral Sir J. E., V.C., K.C.B. *Alverbank, Alverstoke, Hants.*
1873	Compiègne, Marquis de. 10, *Rue de Clichy, Paris.*
1864	Conder, Rev. John. *Hallbrooke-house, New Wandsworth, S.W.*
1876	Congreve, Chas. R., Esq. *Care of R. J. Congreve, Esq., Carlinwark-castle, Douglas, N.B.*
1876	Conlan, Geo. Nugent, Esq. *Tivoli-house, Kingstown, Co. Dublin.*
1861	Constable, Captain Chas. Golding, I.N. 6, *Harley-road, St. John's-wood, N.W.*
1872	*Cook, F. L., Esq. 24, *Hyde-park-gardens, W.*
1868	Cook, H., Esq., M.D., &c. *Care of Messrs. Forbes and Co., 12, Leadenhall-street, E.C.*
1859	Cooke, Lieut.-Col. A. C., R.E. *Bermuda.*
1863	*Cooke, E. W., Esq., A.R.A., F.R.S., F.L.S., F.Z.S., F.G.S., Accad. Bell. Art. Venet. et Holm. Socius. *Glen-Andred, Groombridge, Sussex; and Athenæum Club, S.W.*
1856	670 Cooke, John George, Esq. 25, *Austin Friars, Old Broad-street, E.C.*
1860	Cooke, Nathaniel, Esq. 5, *Ladbroke-terrace, Notting-hill, W.*
1852	Cooke, Robt. F., Esq. 50, *Albemarle-street, W.*
1860	Cooke, William Henry, Esq., Q.C. 42, *Wimpole-street, W.*
1874	Cooke, Capt. W. S., 22nd Regiment. *Adair-house, St. James's-square, S.W.*
1872	*Cookson, F., Esq. *Teddington-hall, Teddington.*
1830	Cooley, William Desborough, Esq. 13, *College-place, Camden-town, N.W.*
1876	Cooling, Edwin, Esq. *Mile Ash, Derby.*
1875	Coombe, Edwd., Esq. *Hillside, Willesden, N.W.*
1872	Cooper, Alfred, Esq. 9, *Henrietta-street, Cavendish-square, W.*
1872	680 Cooper, Commr. B. J., R.N. 31, *Kensington-square, W.*
1877	Cooper, Charles E. E., Esq. *Observatory-house, Kingsdown, Bristol.*
1862	Cooper, Sir Daniel. 20, *Prince's-gardens, South Kensington, S.W.*

Year of Election.		
1856		Cooper, Lieut.-Col. Edward H. (Grenadier Guards). 42, *Portman square, W.*
1860		Cooper, Lieut.-Col. Joshua H. (7th Fusiliers). *Dunboden, Mullingar.*
1873		Cooper, Thos. T., Esq. *Care of Messrs. H. S. King and Co.,* 65, *Cornhill, E.C*
1874		Cooper, William White, Esq. 19, *Berkeley-square, W.*
1876		Coote, Algernon C. P., Esq., M.A. 6, *Park-terrace, Cambridge.*
1857		*Coote, Rear-Admiral Robert, C.B. "*Shales," Bitterne, Southampton.*
1874		Copland-Crawford, Lieut.-Gen. R. F., R.A. *Sudbury-lodge, Harrow, Middlesex*
1853	690	Copley, Sir Joseph William, Bart. *Travellers' Club, Pall-mall, S.W.*
1864		Cork and Orrery, Earl of. 1, *Grafton-street, W.*
1868		Cork, Nathaniel, Esq. *Grennel-house, Sutton, Surrey.*
1868		Corner, William Mead, Esq. *"Surrey View," Howard-road, Woodside, South Norwood; and* 165, *Leadenhall-street, E.C.*
1865		Cornthwaite, Rev. T., M.A. *Forest, Walthamstow.*
1860		Cornwell, James, Esq., PH.D. *Purbrook, Crescent-wood-road, Sydenham-hill, S.E.*
1877		Corscaden, John F., Esq. 24, *Holland-park, W.*
1868		Cory, Frederic C., Esq., M.D. *Portland-villa, Buckhurst hill, Essex; and Nassau-place, Commercial-road, E.*
1873		Cosson, Emilius Albert de, Esq. *Junior Naval and Military Club, Pall-mall, S.W.*
1874		*Cosson, the Baron de. *The Camels, Prince's-road, Wimbledon-park, S.W.; and* 38, *Rue St. Dominique, St. Germain, Paris.*
1869	700	Coster, Guillaume F., Esq. 11, *Park-crescent, Regent's-park, N.W.*
1853		*Cosway, William Halliday, Esq. *Oxford and Cambridge Club, S.W.*
1875		Cotesworth, Wm., Esq. *Cowdenknowes, Roxburghshire, N.B.*
1876		Cotterill, Rev. G. E. 5, *Arlington-villas, Brighton.*
1875		Cotterill, H. B., Esq., B.A. 1, *Athol-place, Edinburgh.*
1856		Cottesloe, Right Hon. Lord. 20, *Eaton-place, S.W.*
1875		Cotton, General Fredk., R.E. *Athenæum Club, Pall-mall.*
1873		Cottrill, Robert Alfred, Esq. *Stanwell-house, Stanwell, near Staines.*
1877		Couch, Right Hon. Sir Richard, Knt. 48, *Linden-gardens, Bayswater-road, W.*
1873		Courtenay, J. Irving, Esq. 3, *Plowden-buildings, Temple, E.C.*
1874	710	*Courtney, Henry Nicholas, Esq., B.A. 2, *Little Stanhope-street, Mayfair, W. and National Club, Whitehall-gardens, S.W.*
1875		Covington, Rev. W., Vicar of St. Luke's. *Shepherd's-bush.*
1875		Coward, Dr. John W. S. *Care of A. B. Hill and Son,* 101, *Southwark-street, S.E.*
1862		Coward, William, Esq. *Rock-bank, Lordship-lane, Dulwich, S.E.*
1857		*Cowell, Lieut.-Col. Sir J. C., K.C.B., R.E. *Buckingham-palace, S.W.*
1854		Cowley, Norman, Esq. 4, *Montagu-place, Montagu-square, W.*
1871		Cowper, Henry Aug. (H.M. Com. Puerto Rico). *Care of Messrs. Woodhead and Co.,* 44, *Charing-cross, S.W.*
1862		*Cowper, Sedgwick S., Esq., J.P. 3, *Westminster-chambers, Victoria-street, S.W.*
1874		Coxon, Samuel Bailey, Esq., F.G.S. *Usworth-hall, Durham.*

Year of Election.

1865 Coysh, John S., Esq. *Levant-house, St. Helen's-place, E.C.*

1870 720 *Cracroft, Bernard, Esq., M.A. Trin. Coll. Camb. *Oxford and Cambridge Club, S.W.; and 1, Stanford-row, South Kensington, S.W.*

1875 *Cragoe, Thos. Adolphus, Esq. *Woodbury-villa, Truro.*

1867 Crane, Leonard, Esq., M.D. 7, *Albemarle-street, W.*

1877 Crane, T. H., Esq. *Ventnor, Isle of Wight.*

1873 Craufurd, George Ponsonby, Esq. *Buenos Ayres; and Travellers' Club, S.W.*

1857 Craufurd, Lieut.-General James Robertson, Grenadier Guards. *Travellers' Club, S.W.; and 36, Prince's-gardens, S.W.*

1875 Craven, Alfred, Esq. *Brookfield-house, Folkestone.*

1848 Crawford, Robert Wigram, Esq. 71, *Old Broad-street, E.C.*

1876 Crawley, Wm. John C., Esq. 3, *Ely-place, Dublin.*

1873 Creswell, Alf. Aug., Esq. 1, *Capel-court, E.C.; and Radford-vicarage, Notts.*

1861 730 Creswell, Rev. Samuel Francis, B.D., F.R.A.S. *Principal of the High School, Dublin.*

1859 *Creyke, Captain Richard Boynton, R.N. *Gristhorpe-hall, Filey, Yorkshire.*

1856 Croker, T. F. Dillon, Esq. 19, *Pelham-place, Brompton, S.W.*

1864 Croll, A. A., Esq., C.E. *Granard-lodge, Roehampton.*

1868 Croll, Alex., Esq. *Mavis-bank, Grange-road, Upper Norwood.*

1860 *Croskey, J. Rodney, Esq. 43, *Portsdown-road, Maida-hill, W.; and* 30, *Parliament-street, S.W.*

1860 *Crosse, Rev. Thomas, D.C.L., M.R.A.S. *Hastings.*

1862 Crossman, James Hiscutt, Esq. *Rolls-park, Chigwell, Essex.*

1875 Crossman, Lieut.-Colonel W., R.E., C.M.G. 30, *Harcourt-terrace, Redcliffe-square, S.W.*

1863 *Crowder, Thos. Mosley, Esq., M.A. *Corpus Christi College, Oxford.*

1852 740 Crowdy, James, Esq. 17, *Serjeants'-inn, E.C.*

1874 Crowe, Francis, Esq., LL.D. 22, *Westbourne-park-road, W.*

1872 Cruikshank, Donald, Esq. *Junior Naval and Military Club.*

1859 Cull, Richard, Esq., F.S.A. 13, *Tavistock-street, Bedford-square, W.C.*

1874 Cumming, Chas. Lennox B., Esq. (Madras Civil Service). 34, *Westbourne-park-road, Bayswater, W.*

1857 Cumming, William Fullarton, Esq., M.D. *Athenæum Club, S.W.; and Kinellan, Edinburgh.*

1860 Cunliffe, Roger, Esq. 24, *Lombard-street, E.C.; and* 10, *Queen's-gate, South Kensington, S.W.*

1853 Cunningham, John Wm., Esq., Sec. King's College. *Somerset-house, W.C.; and Harrow.*

1862 *Cunynghame, Lieut.-Gen. Sir A. T., K.C.B. *United Service Club, Pall-mall, S.W.*

1865 Cure, Capel, Esq. 61, *Grosvenor-street, W.*

1872 750 Curling, Lieut. J. Jas., R.E.

1868 Currie, A. A. Hay, Esq., C.E. 18, *Acqua Sola, Genoa.*

1843 *Cursetjee, Manockjee, Esq., F.R.S.N.A. *Villa-Byculla, Bombay.*

1839 *Curtis, Timothy, Esq.

Year of Election.	
1872	Cust, Robt. Needham, Esq. 64, *St. George's-square, S.W.*
1867	Cuttance, John Fras. J., Esq. *Cleveland-house, Greville-road, Kilburn, N.W.*
1872	Czarnikow, Cæsar, Esq. 29, *Mincing-lane, E.C.*
1874	Dadson, Arthur Jas., Esq. 12, *Magdala-villas, Manor-road, New Cross, S.E.*
1863	*Dalgety, Fred. G., Esq. 16, *Hyde-park-terrace, W.*
1866	*Dalhousie, Right Hon. Earl of. 50, *Lancaster-gate, W.*
1864	760 Dallas, A. G., Esq. 3, *Ennismore-gardens, Prince's-gate, S.W.*
1870	Dallas, Sir Geo. E., Bart. *Foreign-office, Downing-street, S.W.*
1865	D'Almeida, W. B., Esq. 19, *Green-park, Bath.*
1867	Dalrymple, Geo. Elphinstone, Esq. *Logie, Elphinstone, Aberdeenshire.*
1857	Dalton, D. Foster Grant, Esq. *Shanks-house, near Wincanton, Somerset.*
1873	Daly, Chief Justice Chas. P., LL.D. (President of the American Geographical Society, New York). 84, *Clinton-place, New York.*
1859	Dalyell, Sir Robt. Alex. Osborn, Bart. *H.M.'s Consul at Rustchuk, Bulgaria.*
1866	Damer, Lieut.-Col. Lionel S. Dawson. *Came-house, Dorchester.*
1874	*Daniell, Colonel E. Staines. 13, *Wyndham-place, Bryanston-square, W.; and East India United Service Club,* 14, *St. James's-square, S.W.*
1877	Darbishire, Godfrey, Esq. *Victoria-park, Manchester.*
1874	770 Darroch, Geo. Edw., Esq. 40, *Stanhope-gardens, S.W.; and Oxford and Cambridge Club, Pall-mall, S.W.*
1838	*Darwin, Charles, Esq., M.A., F.R.S. *Down, Beckenham, Kent.*
1877	Davenport, Samuel, Esq. *Care of H. D. Davenport, Esq.,* 48, *St. James's-street, S.W.; and Beaumont, near Adelaide, S.A.*
1874	Davidson, Duncan, Esq. 4, *Lancaster-gate, W.*
1874	Davidson, Col. James. *Sneinton Manor-house, Nottingham; and Carlton Club, S.W.*
1863	Davies, Sir R. H., K.C.S.I., Chief Commissioner of Oudh, Lucknow. *Care of Messrs. Twining,* 215, *Strand, W.C.*
1873	Davies, Rev. R. V. Faithfull. *Trinity College, Eastbourne.*
1869	*Davies, Robert E., Esq., J.P. *Cosham-house, East Cosham, Hants.*
1873	Davies, W. Hy. Esq. 51, *Tregunter-road, South Kensington, S.W.*
1866	Davis, Edmund F., Esq. 6, *Cork-street, Bond-street, W.*
1866	780 Davis, Frederick E., Esq. 20, *Blandford-square, N.W.*
1875	Davis, Commr. Hugh, R.N. *Army and Navy Club, Pall-mall.*
1877	Davis, Israel, Esq., M.A. 6, *King's-Bench-walk, Temple, E.C.*
1874	Davis, Rev. James. 7, *Adam-street, Adelphi, W.C.*
1846	Davis, Sir John Francis, Bart., K.C.B., F.R.S., F.R.S.N.A. *Athenæum Club, S.W.; and Hollywood, near Bristol.*
1868	Davis, Richard, Esq. 9, *St. Helen's-place, E.C.*
1874	Dawes, Edwyn, Esq. *Heathfield-lodge, Surbiton.*

Year of Election.	
1875	*Dawnay, Honble. Guy C. 8, *Belgrave-square, S.W.; and Bookham-grove, Leatherhead.*
1840	*Dawnay, The Hon. Payan. *Beningborough-hall, Newton-upon-Ouse, Yorkshire.*
1875	Daymond, Rev. Charles, M.A., Principal of St. Peter's College, *Peterborough.*
1865	790 Debary, Rev. Thomas, M.A. 8, *Chapel-place, Henrietta-street, Cavendish-square.*
1866	Debenham, William, Esq. 16, *Gloucester-place, Portman-square, W.*
1875	De Blaquière, Capt. Lord, R.N. *Scientific Club, 7, Savile-row, W.*
1876	De Crespigny, Aug. C., Esq. *London and County Club, Langham-place, W.*
1856	De Crespigny, Lieutenant C., R.N. *Care of Messrs. King and Co., 65, Cornhill, E.C.*
1876	*Dekeyser, P., Esq. *Chatham-house, Grove-road, Clapham-park.*
1865	*De Laski, A., Esq. 2, *Adelaide-crescent, Brighton.*
1869	De Leon, Dr. Hannnel. 26, *Redcliffe-gardens, West Brompton, S.W.*
1862	Denham, Vice-Adm. Sir Henry Mangles, F.R.S. 21, *Carlton-road, Maida-vale, W.*
1860	Denison, Alfred, Esq. 6, *Albemarle-street, W.*
1876	800 Denman, Hon. Geo. (Judge of the Common Pleas). 11, *Palace-gate, Kensington, W.*
1875	*Denny, Edward Maynard, Esq. 55, *Manchester-street, W.*
1876	Denny, Thos. Anthony, Esq. 7, *Connaught-place, W.; and Budingwood, Horsham.*
1875	*Dennys, N. B., Esq., PH.D. *Hong Kong.*
1872	*Dent, Alfred, Esq. 29, *Chesham-street, S.W.*
1874	Dent, Clinton T., Esq. 29, *Chesham-street, S.W.*
1872	*Dent, Edward, Esq. 12, *Hyde-park-gardens, W.*
1871	Dentry, James, Esq. *The College, Margate.*
1853	*Derby, Edward Henry, Earl of, P.C., LL.D., D.C.L. 23, *St. James's-square, S.W.; and Knowsley-park, Prescot, Lancashire.*
1875	De Ricci, Jas. H., Esq. 2, *Tanfield-chambers, Temple.*
1867	810 De Salis, Major-Gen. Rodolph, C.B. 123, *Pall-mall, S.W.*
1875	De Salis, Wm. Fane, Esq. *Dawley-court, Uxbridge.*
1872	Desmond, Rev. H. M. Egan. 31, *Belsize-park, N.W.; and London and Westminster Bank, 1, St. James's-square.*
1874	Devas, Thomas, Esq. *Mount Ararat, Wimbledon.*
1874	Devereux, W. Cope, Esq., R.N. *Hereford-cottage, Manuel-road, W. Croydon.*
1877	De Vitre, Rev. George, M.A. *Keep Hatch, Wokingham, Berks.*
1837	*Devonshire, William Cavendish, Duke of, K.G., LL.D., D.C.L., F.R.S. *Devonshire house, Piccadilly, W.; and Hardwicke-hall, Derbyshire.*
1853	De Wesselow, Lieut. Fras. G. Simpkinson. 67, *Victoria-street, S.W.*
1872	Dhuleep-Singh, His Highness the Maharaja. *Elvedon-hall, near Thetford.*
1870	Dibdin, Charles, Esq. 62, *Torrington-square, W.C.*
1870	820 Dibdin, Robert W., Esq. 62, *Torrington-square, W.C.*
1862	Dick, Captain Charles Cramond. *Bayford-grange, Hertford.*

Year of Election	
1866	*Dick, Fitzwilliam, Esq., M.P. 20, *Curzon-street, Mayfair, W.*
1861	Dick, Robert Kerr, Esq. (Bengal Civil Service). *Oriental Club, W.*
1866	Dick, William Graeme, Esq. 29, *Leinster-square, W.*
1830	*Dickinson, Francis Henry, Esq., F.S.A. 119, *St. George's-square, Pimlico, S. W.; and Kingweston-park, Somerset.*
1852	Dickinson, John, Esq. *Athenæum Club, S. W.*
1854	*Dickinson, Sebastian Stewart, Esq., M.P., Barrister-at-Law. 12, *Suffolk-street, Pall-mall; and Brown's-hill, Stroud, Gloucestershire.*
1859	Dickson, A. Benson, Esq. 4, *New-square, Lincoln's-inn, W.C.*
1875	*Dickson, Oscar, Esq. *Stockholm. Care of his Excellency Baron Hochschild, Great Cumberland-street, Hyde-park.*
1860	830 Dietz, Bernard, Esq., of Algoa Bay. 3, *Dorset-square, W.*
1859	Digby, G. Wingfield, Esq. *Sherborne-castle, Dorset.*
1860	Digby, Lieut.-Colonel John Almerous. *Chalmington-house, Cattstock, Dorchester.*
1859	*Dilke, Sir Charles Wentworth, Bart., M.P. 76, *Sloane-street, S. W.*
1856	Dillon, The Hon. Arthur. 113, *Victoria-street, S. W.*
1864	Dimsdale, J. C., Esq. 50, *Cornhill, E.C.; and* 52, *Cleveland-square, W.*
1873	Dineen, Thomas, Esq. 1, *Leeds-bridge, Leeds, Yorkshire.*
1872	Divett, Edwd. Ross, Esq. *Reform Club, S. W.*
1867	Dix, Thomas, Esq. 10, *Amwell-street, W.C.*
1872	Dixon, Joseph, Esq. *Hillsbro'-hall, Sheffield.*
1861	840 Dixon, Lieut.-Colonel John.
1854	*Dixon, W. Hepworth, Esq., F.S.A. 6, *St. James's-terrace, St. John's-wood, N. W.*
1873	Dodd, Jno., Esq. *Tamsui, Formosa. Care of Jno. Ewart, Esq.,* 7, *Lancaster-street, Hyde-park, W.*
1876	*Dodson, Geo. Edward, Esq. *Ravensknowle, Anerley, S.E.*
1854	Dodson, Right Hon. John George, M.P. 6, *Seamore-place, Mayfair, W.*
1876	Doran, Colonel John, C.B. *Percy-house, Horn-park, Lee.*
1870	Dorchester, Dudley Wm. Carleton, Lord. 42, *Berkeley-square, W.*
1876	Doré, Henry J., Esq. 38, *Bruton-street, W.*
1873	Doria, Marquis Giacomo. *Genoa. Care of Messrs. Kirkland, Cope, and Co.,* 23, *Salisbury-street, Strand.*
1868	Douglas, John, Esq. *Angus-lodge, Portsea.*
1868	850 Douglas, Captain Neil D. Cecil F. 1, *Morpeth-terrace, Victoria-street, S. W.; and Guards' Club, S. W.*
1875	Douglas, Lieut.-General Sir Percy Bart. *Henlade-house, Taunton, Somerset.*
1871	Douglas, Stewart, Esq. 49, *Elizabeth-street, Eaton-square, S. W.*
1875	*Douglas, W. D. R., Esq. *Orchardton, Castle Douglas, N.B.*
1874	Dowling, Edward Samuel, Esq. 14, *Holland-villas-road, Kensington, W.*
1875	Dowling, Lieut.-Col. James Henry. *Barnwood, near Gloucester.*
1871	Down, J. H. Langdon, Esq., M.D. 39, *Welbeck-street, W.; and Normansfield, Hampton Wick.*

Year of Election.	
1853	Doyle, Sir Francis Hastings C., Bart. *Custom-house, E.C.*
1845	*Drach, Solomon Moses, Esq., F.R.A.S. 23, *Upper Barnsbury-street, N.*
1872	*Drew, Frederic, Esq. *Eton College, Windsor.*
1869	860 *Drummond, Captain Alfred Manners. *Army and Navy Club, S.W.*
1865	Drummond, E. A., Esq. 2, *Bryanston-square, W.*
1846	Drury, Rear-Admiral Byron, R.N. 4, *Cambridge-villas, Cheltenham.*
1851	*Du Cane, Major Francis, R.E. *Brentwood, Essex.*
1851	*Ducie, Henry John, Earl of, F.R.S. 16, *Portman-square, W.*
1875	Duckham, Joseph Hy., Esq., R.N., Dockmaster, *West India Docks, Limehouse Entrance, E.*
1859	Duckworth, Henry, Esq. *Seafield, Waterloo, near Liverpool.*
1875	Du Faur, Eccleston, Esq. *Sydney, New South Wales. Care of Miss Du Faur, 74, Lansdowne-road, Kensington-park, W.*
1860	*Duff, Mountstuart Elphinstone Grant, Esq., M.P. 4, *Queen's-gate-gardens, South Kensington, S.W.*
1868	Duff, Wm. Pirie, Esq. *Calcutta. Care of Messrs. John Watson and Co., 34, Fenchurch-street, E.C.*
1857	870 *Dufferin, Right Hon. Fredk. Temple Hamilton-Blackwood, Earl of, K.P., G.C.M.G., K.C.B., F.R.S. *Clandeboye, near Belfast, Ireland.*
1866	*Dugdale, Captain Henry Charles G. *Merevale-hall, Atherstone, Warwick.*
1867	*Dugdale, John, Esq. 1, *Hyde-park-gardens; and Llwyn, Llanfyllin, Oswestry.*
1868	Dunbar, John Samuel A., Esq. 28, *Pembridge-crescent, Bayswater, W.; and 4, Barnard's-inn, Holborn.*
1863	Duncan, Major Francis, R.A., M.A., D.C.L., LL.D. *Scientific Club, 7, Savile-row, W.*
1861	*Duncan, George, Esq. 45, *Gordon-square, W.C.*
1875	Duncan, John, Esq. *Care of Messrs. Anderson and Co., 17, Philpot-lane, E.*
1873	Dunlop, Alexander Milne, Esq. 28, *Clanricarde-gardens, W.; and 3, Old Palace-yard, Westminster, S.W.*
1875	Dunlop, Hamilton Grant, Esq. 11, *Rockstone-place, Southampton; and Junior Carlton Club, S.W.*
1859	*Dunlop, R. H. Wallace, Esq., C.B. (Indian Civil Service). 12, *Kent-gardens, Castle-hill, Ealing.*
1860	880 *Dunmore, Charles Adolphus Murray, Earl of. 50, *Portland-place, W.*
1868	Dunn, Captain F. J. A. *Portillon, Tours, France.*
1875	Dunn, John M., Esq. 30, *Claverton-street, St. George's-square, S.W.*
1874	Dunn, Wm., Esq. 95, *Bishopsgate-street-within, E.C.*
1867	Dunraven, Wyndham Thos., Earl of. *Coombe-wood, Kingston-on-Thames.*
1875	Dunstone, J. John, Esq. 22, *St. George's-terrace, Caernarvon-street, Glasgow.*
1856	Duprat, Le Vicomte. *Consul-Général de Portugal, 10, St. Mary-Axe, E.C.*
1869	Durham, Edward, Esq. *City-house, Little Chester, near Derby.*
1874	Durnford, Lieut.-Colonel A. W., R.E.
1874	Duthie, Capt. W. H., R.A. *Devonport.*

Year of Election.	
1868	890*Dutton, Frederick H., Esq. 11, *Cromwell-crescent, South Kensington, S.W.*
1874	Dykes, William Alston, Esq. (Provost of Hamilton). *The Orchard, Hamilton, N.B.*
1870	Dymes, Daniel David, Esq. *Windham Club, S.W.; and 9, Mincing-lane, E.C.*
1856	Eardley-Wilmot, Major-Gen. F., M.R.A. 78, *West Cromwell-road, S.W.*
1871	Earle, Arthur, Esq. *Childwall-lodge, Wavertree, near Liverpool; and Windham Club, S.W.*
1869	Eastwick, Edward B., Esq., F.R.S. 88, *Holland-road, Kensington, W.*
1857	Eastwick, Captain W. J. *Cuyuni, Teddington.*
1876	Eaton, Commr. Alfred, R.N. *Brook-house, Melling, near Liverpool.*
1863	Eaton, F. A., Esq. *New University Club, St. James's-street, S.W.*
1862	*Eaton, H. E., Esq. 38, *Rutland-gate, Hyde-park, W.*
1862	900*Eaton, Henry William, Esq., M.P. 16, *Prince's-gate, Hyde-park, W.*
1864	*Eaton, William Meriton, Esq. 16, *Prince's-gate, Hyde-park, W.*
1866	Eatwell, Surgeon-Major W. C. B., M.D. *Oriental Club, Hanover-square, W.*
1876	Ebden, Alfred, Esq.
1875	*Ebden, Charles J., Esq., B.A. *Coghurst-hall, Hastings.*
1861	Eber, General F.
1862	Ebury, Lord. 107, *Park-street, Grosvenor-square, W.; and Moor-park, Herts.*
1862	Eden, Admiral Sir Charles, K.C.B. 9, *Queen's-gate-place, S.W.*
1858	Edge, Rev. W. J., M.A. *Benenden-vicarage, near Staplehurst, Kent.*
1863	Edgeworth, M. P., Esq. (BENG. C.S.). *Mastrim-house, Anerley, S.E.*
1874	910 Edmonds, John Thos., Esq. *Carnavon-house, Varteg, near Pontypool, Monmouthshire.*
1867	*Edward, James, Esq. *Balruddery, by Dundee, N.B.*
1866	*Edwardes, Thomas Dyer, Esq. 5, *Hyde-park-gate, Kensington, W.*
1871	*Edwardes, Thomas Dyer, Esq., jun. 5, *Hyde-park-gate, Kensington, W.*
1868	Edwards, Rev. A. T., M.A. 39, *Upper Kennington-lane, S.E.*
1865	Edwards, G. T., Esq., M.A. 1, *Dr. Johnson's-buildings, Temple, E.C.*
1861	*Edwards, Henry, Esq., M.P. 53, *Berkeley-square, W.*
1871	Edwards, James Lyon, Esq. *Holmwood, Kingston-hill, Surrey.*
1860	Edwards, Major J. B., R.E. *United Service Club, S.W. Care of Messrs. H. S. King and Co., 65, Cornhill, E.C.*
1853	Egerton, Rear-Admiral the Hon. Francis, M.P. *Devonshire-house, W.*
1868	920 Elder, A. L., Esq. *Campden-house, Kensington, W.*
1863	*Elder, George, Esq. *Knock-castle, Ayrshire.*
1867	Eley, Charles John, Esq. 5, *Pelham-place, Kensington, S.W.*
1865	Elias, Ney, jun., Esq. 33, *Inverness-terrace, Bayswater, W.*
1870	Ellenborough, Colonel Lord. *Holly Spring, Bracknell, Berks; and 39, Chapel-street, Belgrave-square, S.W.*

Year of Election		
1876		Elles, Jamieson, Esq. *Wimbledon-common, S.W.*
1876		Elles, Major Wm. K., 38th Regt. *Army and Navy Club, Pall-mall, S.W.*
1875		*Elliot, Colonel Chas., C.B. 28, *Stafford-terrace, Kensington, W.*
1860		Elliot, G., Esq., C.E. *The Hall, Houghton-le-Spring, near Fence Houses, Durham.*
1857		*Elliot, Capt. L. R. *La Mailleraye-sur-Seine, Seine Inférieure. Care of J. L. Elliot, Esq., at C4, Albany, W.*
1871	930	Elliot, William, Esq. 3, *The Limes, Lambert-road, Brixton-rise, S.W.*
1875		Ellis, Sir Barrow H., K.C.S.I. (Mem. Council of India). 1, *Queen's-gate-place, S.W.; and India-office, S.W.*
1873		Ellis, Hon. Evelyn H. *Raleigh Club, Regent-street, S.W.*
1865		Ellis, W. E. H., Esq. *Hasfield-rectory, Gloucester; Oriental Club, W.; and Byculla Club, Bombay.*
1871		Ellis, Walter L. J., Esq. 7, *Brunswick-place, Regent's-park, N.W.*
1874		Elmslie, Jas. A., Esq.
1873		Elmslie, William Esq. *The Laurels, Richmond-hill, S.W.*
1858		Elphinstone, Major Sir Howard C., R.E., K.C.B., V.C., C.M.G. *Buckingham-palace, S.W.*
1875		Elsey, Jno. Green, Esq. *Morant-house, Addison-road, Kensington, W.*
1869		Elsey, Colonel William. *West-lodge, Ealing, W.*
1857	940	Elton, Sir A. H., Bart. *Athenæum Club, S.W.; and Clevedon-court, Somersetshire.*
1873		Elton, Capt. Frederick. *Care of Messrs. H. S. King and Co.*, 45, *Pall-mall, S.W.*
1872		Elwell, W. R. G., Esq. 16, *King-street, St. James's, S.W.*
1868		Ely, John Henry Wellington Graham Loftus, Marquis of. 9, *Prince's-gate, S.W.; and Ely-castle, Fermanagh.*
1877		Emery, John, Esq. 15, *Dunall-park-villas, South Norwood.*
1860		Enfield, Edward, Esq., F.S.A. 19, *Chester-terrace, Regent's-park, N.W.*
1863		Engleheart, Gardner D., Esq. *Duchy of Lancaster Office, Lancaster-place, W.C.*
1876		Errington, Geo., Esq., M.P. 16, *Albany, W.*
1876		*Erskine, Hon. Chas. H. S. *Allan-park, Alloa, N.B.*
1870		Erskine, Claude J., Esq., Bombay Civil Service. 87, *Harley-street, W.; and Athenæum Club, S.W.*
1852	950	Erskine, Admiral John Elphinstone. 1 *L, Albany, W.; and Lochend, Stirling, N.B.*
1857		*Esmeade, G. M. M., Esq. 29, *Park-street, Grosvenor-square, W.*
1874		*Evans, B. Hill, Esq. 23, *St. John's-villas, Upper Holloway, N.*
1870		*Evans, Edward Bickerton, Esq. *Whitbourne-hall, near Worcester.*
1877		Evans, Edward Prichard, Esq. 21, *Primrose-hill-road, Regent's-park, N.W.*
1876		Evans, Colonel E. L. M. *East India United Service Club*, 14, *St. James's-square, S.W.*
1857		Evans, Captain F. J. O., R.N., C.B., F.R.S., F.R.A.S. *Hydrographic-office, Admiralty, S.W.*
1830		*Evans, Vice-Admiral George. 1, *New-street, Spring-gardens, S.W.; and Englefield-green, Staines.*

Year of Election.		
1870		Evans, Lieut.-Colonel Henry Lloyd. 14, *St. James's-square, S.W.*
1857		Evans, Thos. Wm., Esq., M.P. *Allestree-hall, Derby.*
1830	960	*Evans, W., Esq.
1867		Evans, W. Herbert, Esq. *Forde Abbey, Chard, Dorset.*
1865		Evans, Colonel William Edwyn. 55, *Seymour-street, Portman-square, W.*
1861		Evelyn, Lieut.-Colonel George P. 34, *Onslow-gardens, Brompton, S.W.*
1851		*Evelyn, William J., Esq., F.S.A. *Wotton-house, Wotton, near Dorking.*
1875		Everard, Chas. Walter, Esq. (H.M. Consular Service, China). *Care of Rev. S. Everard, Burgate-rectory, Norfolk.*
1830		*Everett, James, Esq., F.S.A.
1865		Everitt, George A., Esq. *Knowle-hall, Warwickshire.*
1874		Evill, William, Esq. *Lyncombe-house, St. John's-hill, Wandsworth.*
1873		Ewart, John, Esq. 7, *Lancaster-street, Hyde-park, W.*
1856	970	Ewing, J. D. Crum, Esq. 3, *Lime-street-square, E.C.*
1857		Eyre, Edward J., Esq. *The Grange, Steeple Aston, Oxford.*
1861		Eyre, George E., Esq. 59, *Lowndes-square, Brompton, S.W.*
1856		Eyre, Major-Gen. Sir Vincent, K.C.S.I. *Athenæum Club, S.W.*
1871		Eyton, Wm. Campbell, Esq. *Care of Messrs. Peele and Peele, Shrewsbury.*
1873		Fair, John, Esq. 50, *Hamilton-terrace, St. John's-wood, N.W.*
1870		Fairbridge, Charles, Esq. (Queen's Proctor). *Care of J. R. Izat, Esq., Altamont, Crick-road, Oxford.*
1869		Fairfax, Captain Henry, R.N. *Army and Navy Club, S.W.*
1856		Fairholme, George Knight, Esq. *Care of Mr. Ridgway*, 169, *Piccadilly, W.*
1870		Fairland, Edwin, Esq., M.D. (Surg. 21st Hussars). *Lucknow, Oude.*
1838	980	Falconer, Thomas, Esq. *Usk, Monmouthshire.*
1868		Falconer, William, Esq. *Gothic-house, St. Ann's-road, Stamford-hill, N.*
1857		Falkland, Lucius Bentinck, Viscount. *Skutterskelfe, Yorkshire.*
1871		Fane, Edward, Esq. 14, *St. James's-square, S.W.*
1855		*Fanshawe, Admiral E. G., C.B. 74, *Cromwell-road, S.W.*
1874		Farmer, Edmund, Esq. 10, *Southwick-place, Hyde-park-square, W.*
1873		Farmer, James, Esq. 6, *Porchester-gate, Kensington-gardens, W.*
1874		Farquhar, Walter, Esq. *Care of Messrs. Forbes, Forbes and Co.*, 9, *King William-street, E.C.*
1868		*Farquharson, Major.-Gen. G. McB. *St. John's-villa, Cathnor-road, Shepherd's-bush, W.*
1873		Farrar, R. Bishop, Esq.
1875	990	Farrer, Hy. Richard, Esq. 46, *Eaton-place, S.W.; and Green Hammerton-hall, York.*
1863		*Farrer, W. Jas., Esq. 18, *Upper Brook-street, W.*

Year of Election

1874 *Faulconer, Rob. Stephen, Esq. *Fairlawn, Clarence-road, Clapham-park, S.W.*
1877 Faulkner, Joseph, Esq. 101, *Asylum-road, S.E.*
1863 *Faunthorpe, Rev. J. P., M.A. *Whitelands Training-college, Chelsea.*
1869 Fawcett, Captain Edward Boyd, M.A. 3, *Barnpark-terrace, Teignmouth, Devon.*
1874 Fawssett, Frederick, Esq., M.D. *Westgate, Louth, Lincolnshire.*
1853 *Fayrer, Surgeon-General Sir Joseph, K.C.S.I., M.D. 16, *Granville-place, Portman-square, W.*
1875 Feilden, Capt. Hy. Wemyss, R.A. *Langholm-villa, Shooters'-hill, E.C.*
1876 *Feilden, Lieut.-Colonel O. B. (78th Highlanders). *Shaw-hill, Chorley, Lancashire.*
1866 1000 Felkin, William, Esq., jun., F.Z.S. 22, *Upper Talbot-street, Nottingham.*
1874 Fenn, Thomas, Esq. 14, *Bedford-square, W.C.*
1872 Fenner, William A., Esq. *Thatched House Club, St. James's-street, S.W.; and Woodlands, Kenn, near Exeter.*
1875 Ferguson, Jno., Esq. 10, *Staple Inn, W.C.*
1840 *Fergusson, James, Esq., F.R.S., D.C.L. 20, *Langham-place, W.*
1875 Fergusson, Right Hon. Sir James, Bart. *Kilkerran, Maybole, N.B.*
1876 Ferris, Colonel W. Spiller. 31, *Cornwall-road, Bayswater.*
1871 Festing, Major Robert, R.E. *South Kensington Museum, S.W.*
1876 Few, Robert Hamilton, Esq. *Southey-grange, Lingfield-road, Wimbledon.*
1874 Fielden, Joshua, Esq., M.P. *Nutfield-priory, Redhill, Surrey.*
1875 1010 *Figgis, Samuel, Esq. *The Lawn,* 105, *Tulse-hill, S.W.*
1877 Findlay, John, Esq. 10, *Belmont-crescent, Glasgow.*
1862 Finnis, Thomas Quested, Esq., Alderman. *Wanstead, Essex, E.*
1874 Firth, Fras. Helme, Esq. 25, *Cockspur-street, S.W.*
1870 *Firth, John, Esq., J.P. *Care of Messrs. R. Buckland and Son, Hop-gardens, St. Martin's-lane, W.C.*
1869 Fitch, Frederick, Esq., F.R.M.S. *Hadleigh-house, Highbury-new-park, N.*
1876 *Fitz-Adam, John T., Esq. 5, *Phillimore-gardens, Kensington, W.*
1857 *Fitzclarence, Commander the Hon. George, R.N. 1, *Warwick-square, S.W.*
1872 Fitzgerald, A., Esq. *Verulam Club,* 54, *St. James's-street, S.W.*
1847 Fitzgerald, G. V. S., Esq. *India-office, S.W.*
1861 1020 Fitzgerald, Captain Keane. 2, *Portland-place, W.*
1873 Fitz-Gerald, R. U. Penrose, Esq. 110, *Eaton-square, S.W.*
1873 Fitz-James, Frank, Esq., C.E. *Benares.*
1874 *Fitz Roy, Capt. Rob. O'Brien, R.N. *United Service Club, Pall-mall.*
1857 Fitzwilliam, The Hon. C. W., M.P. *Brookes's Club, St. James's-street, S.W.*
1865 *Fitzwilliam, William S., Esq. 12, *Gunter's-grove, West Brompton, S.W.*
1837 *Fitzwilliam, William Thomas, Earl. 4, *Grosvenor-square, W.; and Wentworth-house, Rotherham, Yorkshire.*
1863 Fleming, G., Esq. *Brompton Barracks, Chatham.*
1861 *Fleming, John, Esq., C.S.I. *Homewood, Chiselhurst.*
1865 Fleming, Rev. T. S. *The Vicarage, St. Clement's, Leeds.*
1853 1030 *Flemyng, Rev. Francis P. *Sgor Bheann, near Dunoon, Argyleshire.*

Year of Election.		
1857		Fletcher, Thomas Keddey, Esq. *Union-dock, Limehouse, E.*
1876		*Floersheim, Louis, Esq. 11, *Hyde-park-street, W.*
1876		Floyer, Ernest A., Esq. 7, *The Terrace, Putney, S.W.*
1877		Fogo, J. M., Esq. (Surg.-General). *Army and Navy Club, Pall-mall, S.W.*
1873		Foggo, Geo., Esq. *Oriental Club, W.*
1864		Foley, Major-Gen. the Hon. St. George, C.B. 24, *Bolton-street, W.*
1876		*Foljambe, Cecil. G. S., Esq. *Cockglode, Ollerton, Newark.*
1874		Folkard, A., Esq. *Thatched House Club, St. James's-street, S.W.*
1861		Foord, John Bromley, Esq. *May-villa, Bexley Heath.*
1874	1040	*Foot, Capt. C.E., R.N. *Care of Messrs. Hildreth and Ommanney,* 41, *Norfolk-street, Strand, W.C.; and United Service Club, Pall-mall.*
1874		Forbes, A. Litton, A., Esq. *Buckingham Club,* 1, *Regent-street, S.W.*
1863		Forbes, Capt. C. J. F. Smith. *Care of Messrs. H. S. King and Co.,* 45, *Pall-mall, S.W.*
1867		Forbes, Geo. Edward, Esq. *Colinton, Ipswich, Queensland; Union Club, S.W.;* 11, *Melville-street, Edinburgh; and New Club, Edinburgh.*
1873		Forbes, General Jno., C.B. *Inverernan, Strathdon, Aberdeenshire; and Forbes and Co.,* 12, *Leadenhall-street, E.C.*
1874		Forbes, Major Jno. G., R.E. *Care of Messrs. Grindlay and Co.,* 55, *Parliament-street, S.W.; and* 14, *St. James's-square, S.W.*
1876		Forbes, J. S., Esq. *London, Chatham, and Dover Railway Office, Victoria-station, S.W.*
1860		Forbes, Lord, M.A. *Castle Forbes, Aberdeenshire.*
1873		Forbes, W. F., Esq. *Loch-cote-house, Bathgate, N.B.; and Castleton.*
1869		Ford, Major-General Barnett (late Governor of the Andaman Islands). 31, *Queensborough-terrace, Hyde-park, W.*
1875	1050	*Ford, Francis Clare, Esq. (Chargé d'Affaires, Darmstadt). 17, *Park-street, Grosvenor-square, W.*
1874		Forde, Henry Charles, Esq., C.E. *Ridgway-place, Wimbledon.*
1874		*Forlong, Major-General J. G. R. (Madras Staff Corps). *Chartered Mercantile Bank,* 65, *Old Broad-street, E.C.*
1872		*Forrest, Alex, Esq., Survey Department of Perth. *Western Australia.*
1876		Forrest, James, Esq. *Kirriemuir, N.B.*
1872		*Forrest, Jno., Esq. *Perth, Western Australia.*
1874		Forssman, Comr. O. A. (Consul for Portugal). *Potschefstroom, Transvaal Republic, S. Africa. Care of Vicomte Duprat,* 8, *St. Mary Axe, E.C.*
1868		Forster, Hon. Anthony. *Finlay-house, Brittany-road, St. Leonards-on-Sea.*
1876		*Forster, John, Esq. *Oriental Club, Hanover-square, W.*
1839		*Forster, Right Hon. William Edward, M.P. 80, *Eccleston-square, S.W.; and Burley, near Otley.*
1867	1060	Forsyth, Sir T. Douglas, K.C.S.I., C.B., Punjaub. 44, *Onslow-square, South Kensington, S.W.*
1861		Forsyth, William, Esq., M.P., Q.C. 61, *Rutland-gate, S.W.*
1861		*Fortescue, Hon. Dudley F. 9, *Hertford-street, Mayfair, W.*

Year of Election.	
1873	Foss, Edward William, Esq. *Trensham-house, Croydon.*
1873	Foss, G. Lush, Esq. *Clevedon-house, Coronation-road, Bristol.*
1866	Foster, Edmond, jun., Esq. 79, *Portsdown-road, Maida-vale, W.*
1871	Foster, James Murray, Esq., L.M.D., F.R.C.P., F.S.A., &c. *Nazeerah, Assam, Bengal. Care of Joseph Foster, Esq., Collumpton, Devon.*
1876	Foster, R. G., Esq. 4, *St. James's-place, Gloucester.*
1873	Fowler, A. Grant, Esq. *Care of Alex. Denoon, Esq., Beckenham, Kent.*
1863	*Fowler, J. T., Esq. *Government Inspector of Schools, Adyar, Madras, India. Care of Rev. A. Wilson, National Society's Office, Sanctuary, Westminster.*
1872	1070 *Fowler, John, Esq., C.E. *Thornwood-lodge, Campden-hill, W.*
1850	*Fowler, Robert N., Esq. M.A. 50, *Cornhill, E.C.; and Tottenham.*
1859	Fox, Lieut.-Colonel A. Lane. *Guildford, Surrey.*
1866	Fox, D. M., Esq., Chief Eng. Santos and St. Paulo Railway. *St. Paulo, Brazil. Care of G. H. Hillier, Esq.,* 111, *Gresham-house, Old Broad-street, E.C.*
1864	*Fox, Francis E., Esq., B.A. *The Mount, Mannamead, Plymouth.*
1876	Fox, Francis Wm., Esq. *Grove-house, Stoke Bishop, near Bristol.*
1865	Fox, Samuel Crane, Esq. 31, *Cambridge-gardens, Notting-hill, W.*
1876	Fox, Lieut. T. A., R.N.R. 3, *Albert-terrace, Lower Addiscombe-road, Croydon.*
1865	*Franks, Aug. W., Esq. 103, *Victoria-street, S.W.*
1860	Franks, Charles W., Esq. 2, *Victoria-street, S.W.*
1862	1080 Fraser, Captain H. A., I.N. *Zanzibar. Care of Messrs. Grindlay,* 55, *Parliament-street, S.W.*
1874	Fraser, Jas. Grant, Esq., C.E. 9, *Great Queen-street, Westminster, S.W.*
1866	Fraser, Captain T. *Care of Col. Macdonald, Senior United Service Club, S.W.*
1868	Frater, Alex., Esq. *Tamsui, Formosa. Care of James Frater, Esq., Town-house, Aberdeen.*
1873	Freeland, H. W., Esq. *Chichester; and Athenæum Club, Pall-mall.*
1868	Freeman, Henry W., Esq. *Thirlestaine-hall, Cheltenham.*
1869	Freke, Thomas George, Esq. 1, *Cromwell-houses, Kensington, S.W.*
1863	Fremantle, Captain Hon. Edmund Robert, R.N., C.B., C.M.G. 20, *Eaton-place, S.W.*
1864	Freme, Major James H. *Wrentnall-house, Shropshire; and Army and Navy Club, S.W.*
1872	French, Colonel P. F. 8, *Duke-street, St. James's, S.W.*
1877	1090 Frere, Lieut. Bartle C. A. *Wressil-lodge, Wimbledon, S.W.*
1850	Frere, Bartle John Laurie, Esq. 45, *Bedford-square, W.C.*
1839	*Frere, George, Esq. 16, *Great College-street, S.W.*
1867	Frere, Right Hon. Sir Hy. Bartle Edw., Bart., P.C., G.C.B., G.C.S.I., D.C.L., *Wressil-lodge, Wimbledon, Surrey.*
1842	Frere, William Edw., Esq., F.R.A.S. *The Rectory, Bitton, Gloucestershire.*
1869	*Freshfield, Douglas W., Esq. 6, *Stanhope-gardens, South Kensington, S.W.; and United University Club, S.W.*
1873	*Freshfield, W. Dawes, Esq. 64, *Westbourne-terrace, W.*
1877	Frewen, Richard, Esq. *Wanderers' Club, Pall-mall, S.W.*
1872	Friedrichsen, Aug. Daniel, Esq. 3, *Queen's-gate-terrace, S.W.*

Year of Election.

1874 Frith, Rev. William. 3, *Brunswick-villas, Cambridge-road, Turnham-green.*

1876 1100*Fry, Frederick Morris, Esq. 14, *Montague-street, Russell-square, W.C.*

1876 Fry, Rev. Henry John. *Warkton, Kettering, Northamptonshire.*

1863 Fuidge, William, Esq. 5, *Park-row, Bristol.*

1865 Fuller, Thomas, Esq. 119, *Gloucester-terrace, Hyde-park, W.; United University Club, S.W.*

1860 Fussell, Rev. J. G. Curry. 16, *Cadogan-place, S.W.; and Kiloskehane-castle, Templemore, Ireland.*

1868 Fyfe, Andrew, Esq., M.D. 112, *Brompton-road, S.W.*

1866 Fytche, Major-General Albert, C.S.I. 21, *Lowndes-square, S.W.; and Reform Club, S.W.*

1863 *Gabrielli, Antoine, Esq. 6, *Queen's-gate-terrace, Kensington, S.W.*

1875 Gahan, C. F., Esq. *India-office, S.W.; and Woodslee, Kingston-hill.*

1858 Gaisford, Thomas, Esq. *Travellers' Club, S.W.*

1877 1110Galbraith, Wm. Robert, Esq., C.E. 91, *Finchley-road, N.W.*

1872 Gale, Henry, Esq., C.E. *Care of Mr. A. S. Twyford, 5, Southampton-street, Bloomsbury, W.C.*

1855 *Galloway, John James, Esq.

1869 Galsworthy, Frederick Thomas, Esq. 8, *Queen's-gate, Hyde-park, S.W.*

1873 Galsworthy, Robt. Herbert, Esq. 61, *Gloucester-place, Portman-square, W.*

1848 *Galton, Captain Douglas, R.E. 12, *Chester-street, Grosvenor-place, S.W.*

1850 *Galton, Francis, Esq., M.A., F.R.S. 42, *Rutland-gate, S.W.; and 5, Bertie-terrace, Leamington.*

1871 Galton, Theodore Howard, Esq. 78, *Queen's-gate; and Hadzor-house, Droitwich.*

1854 *Gammell, Major Andrew. *Drumtochty, Kincardineshire, N.B.*

1873 *Gardiner, H. J., Esq. 6, *Orsett-terrace, Westbourne-terrace, W.*

1869 1120Gardner, Christopher T., Esq. *British Consulate, Canton.*

1865 Gardner, Captain G. H., R.N. *Woodside, Eltham.*

1876 Gardner, Henry Dent, Esq. *Sherwood, Eltham-road, S.E.*

1866 Gardner, John Dunn, Esq.

1863 Gascoigne, Frederic, Esq.

1875 Gaskin, Rev. Joseph. *Chateau Belle Assise, Boulogne-sur-mer. Care of Wesleyan-mission-house, Bishopsgate-street-within, E.C.*

1859 *Gassiot, John P., jun., Esq. *The Culvers, Carshalton, Surrey.*

1866 Gastrell, Lieut.-Col. James E. (Beng. Staff Corps). *Surveyor-General's Office, Calcutta. Care of H. T. Gastrell, Esq., 36, Lincoln's-inn-fields, W.C.*

1866 *Gatty, Charles H., Esq., M.A. *Felbridge-park, East Grinstead, Sussex.*

1873 Gawler, Colonel J. C. *Tower of London, E.C.*

1875 1130Gayfer, Wm., Esq. *Middle-class-school, Bromley, Kent.*

1873 *Geiger, Jno. Lewis, Esq. 75, *Onslow-gardens, South Kensington, S.W.*

1870 *Gellatly, Edward, Esq. *Uplands, Sydenham.*

Year of Election.	
1865	George, Rev. H. B. *New College, Oxford.*
1876	*Ghewy, Albert Brown, Esq., C.E. *Fundicao du Bowman, Rua do Pernambuco.*
1866	*Gibb, George Henderson, Esq. 13, *Victoria-street, Westminster, S.W.*
1859	*Gibbs, H. Hucks, Esq. *St. Dunstan's, Regent's-park, N.W.*
1873	Gibbs, James, Esq.
1873	Gibbs, Jno. Dixon, Esq. *The Willows, Englefield-green, N.*
1870	Gibson, James Y., Esq. *Care of Messrs. Williams and Norgate, Henrietta-street, Covent-Garden, W.C.*
1877	1140 *Gilford, Rear-Admiral the Right Hon. Lord. 8, *Hereford-gardens, S.W.; and Admiralty, Whitehall, S.W.*
1874	Gill, Lieutenant W. J., R.E. 1, *Edinburgh-mansions, Victoria-street; and Junior United Service Club, Charles-street, S.W.*
1855	Gillespie, Alexander, Esq. *Heathfield, Walton-on-Thames, Surrey.*
1866	*Gillespie, William, Esq. (*of Torbane-hill*). 46, *Melville-street, Edinburgh.*
1868	*Gillett, Alfred, Esq. 27, *Chesham-place, S.W.*
1863	*Gillett, William, Esq. 6, *William-street, Lowndes-square, S.W.*
1861	Gilliat, Alfred, Esq. *Keydell, Horndean, Hants.*
1868	Gilliat, Algernon, Esq. 7, *Lancaster-gate, W.*
1863	Gillies, Robert, Esq., C.E. *Care of Messrs. Reith and Wilkie, Dunedin, Otago, N.Z. Per Messrs. Sampson Low and Co.*, 188, *Fleet-street, E.C.*
1874	*Gilman, Ellis, Esq. 53, *Sussex-gardens, Hyde-park, W.*
1864	1150 Gladstone, George, Esq. 31, *Ventnor-villas, Cliftonville, Brighton.*
1863	Gladstone, J. H., Esq., PH.DR. 17, *Pembridge-square, W.*
1862	*Gladstone, Robert Stuart, Esq.
1864	*Gladstone, W. K., Esq.
1873	Glanville, Silvanus Goring, Esq. 52, *Threadneedle-street, E.C.*
1872	Glass, James George Henry, Esq. 28, *London-street, Edinburgh. Care of Messrs. King and Co.*, 45, *Pall-mall, S.W.*
1867	Glass, H. A., Esq. *St. Kilda, Vanbrugh-park, Blackheath, S.E.*
1854	Glen, Joseph, Esq., Mem. Geogr. Soc. of Bombay. *Oriental Club, W.*
1857	Glover, Capt. Sir John H., R.N., G.C.M.G. 27, *Bury-street, St. James's, S.W.*
1866	Glover, Robert Reaveley, Esq. 22, *Great St. Helen's, E.C.*
1870	1160 Glover, Colonel T. G., R.E. *Barwood, Hersham, near Esher, Surrey.*
1864	Glyn, Sir Richard George, Bart. *Army and Navy Club, S.W.*
1874	*Godman, F. Du Cane, Esq. 6, *Tenterden-street, W.; and Child Okeford-house, Blandford.*
1874	Goldsmid, Bartle, Esq. 32, *Nottingham-place, Marylebone, W.*
1868	Goldsmid, Sir Francis, Bart., M.P. *Inner-circle, Regent's-park, N.W.*
1863	Goldsmid, Maj.-Gen. Sir Frederic John, K.C.S.I., C.B. 3, *Observatory-avenue, Kensington; and United Service Club, S.W.*
1861	Goldsmid, Julian, Esq. 105, *Piccadilly, W.*
1873	Goldsworthy, R. Tuckfield, Esq. *Army and Navy Club.*
1860	Gooch, Thomas Longridge, Esq. *Team-lodge, Saltwell, Gateshead-on-Tyne.*

Year of Election	
1877	Goodall, Abraham, Esq., M.D. 4, *Elvaston-place, Queen's-gate, S.W.*
1864	1170 Goodall, George, Esq. *Junior Carlton Club, S.W.*
1864	*Goodenough, Lieut.-Col. W. H., R.A. *Woolwich. Care of Messrs. Cox and Co., Craig's-court, S.W.*
1875	Goodinge, Jas. W., Esq. 18, *Aldersgate-street, E.C.*
1874	Goodliffe, Fras. Gimber, Esq. *Care of Messrs. Goodliffe and Smart,* 95, *Bishops-gate-street-within, E.C.*
1871	*Goodwin, William, Esq. 27, *Grosvenor-road, Birkenhead.*
1865	*Goolden, Charles, Esq. *United University Club, S.W.*
1861	Gooldin, Joseph, Esq. 18, *Lancaster-gate, W.*
1856	*Gordon, Major-General the Hon. Sir Alexander H., K.C.B. 50, *Queen's-gate-gardens, South Kensington, S.W.*
1874	Gordon, Arthur Leo, Esq. *Wardhouse, Aberdeenshire; and* 42, *Duke-street, St. James's, S.W.*
1873	Gordon, J. Newall, Esq. *Morro Velho, Minas Geraes, Brazil. Care of John Hockin, Esq.,* 8, *Tokenhouse-yard, Lothbury, E.C.*
1874	1180 Gordon, Robt., Esq., C.E. *Care of Messrs. Nutt,* 270, *Strand, W.C.*
1870	Gordon, Russell Manners, Esq. *Funchal, Maderia.*
1866	Gore, Colonel Augustus F. *St. Vincent.*
1853	Gore, Richard Thomas, Esq. 6, *Queen-square, Bath.*
1874	Gore, Lieut. St. George C., R.E. *Care of Messrs. Grindlay and Co.,* 55, *Parliament-street, S.W.*
1859	Gosling, Fred. Solly, Esq. 23, *Spring-gardens, S.W.*
1870	Gottlieb, Felix Henry, Esq., J.P. *Singapore, East Indies.*
1875	Gotto, Hy. Jenkin, Esq. *Croft-lodge, Highgate-road, N.W.*
1868	Gough, Hugh, Viscount, F.L.S. *Lough Cutra Castle, Gort, Co. Galway.*
1876	*Gould, Abraham, Esq. *Somerset-lodge,* 111, *Adelaide-road, N.W.*
1873	1190 Gould, Rev. Jas. Aubrey. *L* 4, *Albany, W.*
1846	Gould, John, Esq., F.R.S., F.L.S. 26, *Charlotte-street, Bedford-square, W.C.*
1870	Gould, Rev. Robert John. *Stratfield Mortimer, near Reading.*
1872	Gourley, Colonel E., M.P. *Sunderland.*
1867	Grabham, Michael, Esq., M.D.
1868	Graeme, H M. S., Esq.
1869	Graham, Andrew, Esq. (Staff Surg. R.N.). *Army and Navy Club, S.W.*
1858	Graham, Cyril C., Esq., Governor of Grenada, *West Indies.*
1871	Graham, J. C. W. Paul, Esq. 1, *Carlisle-place, Victoria-street, S.W.; and Brookes's Club, St. James's-street, S.W.*
1874	Graham, James Henry Stuart, Esq. 1, *Belgrave-terrace, Shepherd's-bush, W.*
1875	1200 Graham, Robert Geo., Esq. *Lyndhurst, Roehampton, Surrey.*
1868	*Graham, Thomas Cuninghame, Esq. *Carlton Club, S.W.; and Dunlop-house, Ayrshire.*
1870	*Grant, Andrew, Esq. *Invermay-house, Bridge of Earn, N.B.*
1863	*Grant, C. Mitchell, Esq.

Year of Election.	
1861	Grant, Daniel, Esq. 12, *Cleveland-gardens, Hyde-park, W.*
1865	*Grant, Francis W., Esq. 40, *Pall-mall, S.W.*
1860	Grant, Lieut.-Col. James A., C.B., C.S.I., F.R.S. *E. India U.S. Club, S.W.*; 19, *Upper-Grosvenor-street, W.*; and *Ivy-bank, Nairn, N.B.*
1875	Grant, Jno., Esq. *Grampian-lodge, Putney.*
1862	Grant, Lieutenant J. Murray (Inspector Cape Frontier Police), Cape of Good Hope.
1873	Grant, Colonel W. Francis. *L 6, Albany, W.*
1874	1210 Grantham, Geo., Esq. *Barcombe-place, near Lewes.*
1876	Grattan, Edmund A., Esq., H. M. C., Antwerp. *Care of Messrs. O'Brien and Co., Parliament-street, S.W.*
1872	Gray, Andrew, Esq. 1, *Lime-street-square, E.C.*
1876	*Gray, Archibald, Esq. 37, *Holland-park, W.*; and 13, *Austin Friars, E.C.*
1870	Gray, Charles W., Esq. 14, *Chester-terrace, Regent's-park, N.W.*
1871	Gray, Mathew, Esq. *St. John's-park, Blackheath, S.E.*
1875	*Gray, Matthew Hamilton, Esq. *St. John's-park, Blackheath, S.E.*
1873	Gray, Robert Kaye, Esq. *St. John's-park, Blackheath, S.E.*
1868	Gray, Lieut.-Colonel William. *Farley-hall, Reading.*
1862	Greathed, Lieut.-Colonel Wilberforce W. H., C.B. 10, *Portugal-street, W.*
1863	1220 Greaves, Rev. Richard W. 1, *Whitehall-gardens, S.W.*
1861	Green, Captain Francis, 58th Regiment.
1876	Green, Geo., Esq. *Glanton-house, Sydenham-rise.*
1876	Green, Geo. P. E., Esq. 100, *Gower-street, Bedford-square, W.C.*
1871	Green, Joseph E., Esq. 12A, *Myddelton-square, E.C.*
1876	Green, Colonel Malcolm, C.B. 78, *St. George's-road, S.W.*
1877	Green, Walter, Esq. 15, *Pall-mall, S.W.*
1868	Green, Rev. W., M.A. *Chaplain to the Tower of London.*
1869	Green, Major-General Sir W. H. R., K.C.S.I., C.B. 93, *Belgrave-road, S.W.*
1874	Greenfield, Thomas Challen, Esq. 84, *Basinghall-street, E.C.*; and 6, *Outram-villas, Addiscombe.*
1857	1230 *Greenfield, W. B., Esq. 35, *Gloucester-square, Hyde-park, W.*; and *Union Club, S.W.*
1870	Greenup, W. Thomas, Esq. 22, *Havelock-square, Sheffield.*
1871	Greg, Thomas, Esq. 8, *Eaton-square, S.W.*
1858	*Gregory, Sir Augustus Charles. *Surveyor-General, Brisbane, Queensland, Australia.*
1858	Gregory, Charles Hutton, Esq., C.E. 1, *Delahay-street, Westminster, S.W.*
1860	*Gregory, Francis Thomas, Esq. *Queensland.*
1858	*Gregory, Isaac, Esq. *Merchants'-college, Blackpool.*
1872	Gregson, George, Esq. 26, *Harley-street, Cavendish-square, W.*
1857	*Grellet, Henry Robert, Esq. *Care of M. Misa, Esq.*, 41, *Crutched Friars, E.C.*
1865	Grenfell, Henry R., Esq., M.P. 15, *St. James's-place, S.W.*
1830	1240 *Greswell, Rev. Richard, M.A., F.R.S. 39, *St. Giles's-street, Oxford.*
1877	Grey, Albert, Esq., B.A. *St. James's-palace, S.W.*

Year of Election.	
1866	Grey, Charles, Esq. *The Cottage, Staines.*
1875	Grey, Adm. Hon. Sir F. W., G.C.B. *Linwood, Sunningdale, Staines.*
1837	*Grey, Sir George, K.C.B.
1873	Grey, Captain H. (Bengal Staff Corps).
1864	Grierson, Charles, Esq.
1874	Griesbach, C. L., Esq. 64, *Elgin-crescent, W.*
1868	Griffin, Daniel, Esq. 18, *Leadenhall-street, E.C.*
1861	*Griffith, Daniel Clewin, Esq. 20, *Gower-street, W.C.*
1839	1250 Griffith, John, Esq. 16, *Finsbury-place-south, E.C.*
1863	Griffith, Sir Richard. *Henderoyde-park, Kelso, N.B.*
1836	Griffith, Richard Clewin, Esq. 20, *Gower-street, W.C.*
1872	Griffiths, Arthur Edward, Esq. 25, *Talbot-square, Hyde-park, W.*
1867	Griffiths, Captain A. G. F. 3, *Keith-terrace, Shepherd's-bush, W.*
1875	Grignon, James, Esq. 36, *Bury-street, St. James's, S.W.*
1855	Grindrod, R. D., Esq., M.D., LL.D., F.L.S., &c. *Townsend-house, Malvern.*
1872	Grinlinton, J. J., Esq. *Colombo, Ceylon.* *Care of Edward Woods, Esq.*, C.E., 3, *Great George-street, S.W.*
1861	Grosvenor, Lord Richard, M.P. 76, *Brook-street, Bond-street, W.*
1876	Grove, George, Esq. *Lower Sydenham, S.E.*
1857	1260 Gruneisen, Charles Lewis, Esq. 16, *Surrey-street, Strand, W.C.*
1876	Guillemard, F. H. H., Esq. *Eltham, Kent.*
1876	Gunn, Arthur, Esq. 4, *Oak-villas, Hampstead, N.W.*
1861	Gunnell, Captain Edmund H., R.N. *Army and Navy Club, S.W.; and* 21, *Argyll-road, Campden-hill, W.*
1859	*Gurney, John H., Esq. *North Repps, Norwich.*
1857	Gurney, Samuel, Esq. 20, *Hanover-terrace, Regent's-park, N.W.*
1874	Gwynne, Fras. A., Esq. *Royal Thames Yacht Club, Albemarle-street, W.*
1872	*Gwynne, James Eglinton W., Esq., C.E., F.S.A., J.P., &c. 97, *Harley-street, W., and Cliff-house, Dovercourt, Essex.*
1876	Gwynne, Samuel G., Esq. *Shoul-hill College, Cannock, Stafford.*
1865	Gwyther, John Howard, Esq. *Ellerslie, Park-hill-road, Addiscombe.*
1870	1270 Habicht, Claudius Edward, Esq. 62, *Cornwall-gardens, S.W.*
1874	Hadow, J. W., Esq. 13, *Bruton-street, Berkeley-square, W.; and* 14, *St. James's-square, S.W.*
1877	Haines, C. Henry, Esq., M.D. 140, *Buckingham-palace-road, S.W.*
1874	Hairby, Edward, Esq. 22, *Victoria-villas, King Edward's-road, S. Hackney.*
1868	Hale, Rev. Edward, M.A. *Eton College; and United University Club, S.W.*
1877	Halford, F. B., Esq. 26, *Cleveland-gardens, Hyde-park, W.*
1860	Haliday, Major-General William Robert. *United Service Club, S.W.*
1853	Halifax, Viscount, G.C.B. 10, *Belgrave-sq., S.W.; and Hickleton, Yorkshire.*

Year of Election.		
1853		*Halkett, Rev. Dunbar S. *Little Bookham, Surrey.*
1853		*Halkett, Commander Peter A., R.N.
1874	1280	Hall, Alex. Lyons, Esq. *Lyons-court, Ladbroke-road, Holland-park, W.*
1861		Hall, Charles Hall, Esq. *Watergate-house, Emsworth.*
1876		Hall, Ed. Alg., Esq. 20, *Clarges-street, W.*
1869		*Hall, James MacAlester, Esq.
1862		Hall, James Tebbutt, Esq. *Fore-street, Limehouse, E.*
1871		Hall, Admiral Robert, C.B. 38 *Craven-hill-gardens, W.; and Admiralty, S.W.*
1863		Hall, Thomas F., Esq., F.C.S. *Effingham-house, near Leatherhead.*
1876		Hall, Wm. Ed., Esq. 20, *Onslow-gardens, S.W.*
1853		Hall, Admiral Sir William Hutcheson, K.C.B., F.R.S. *United Service Club, S.W.; and* 48, *Phillimore-gardens, Kensington, W.*
1872		*Halpin, Capt. R. C. 38, *Old Broad-street, E.C.*
1871	1290	*Hamilton, Lieut. Andrew (102nd Regiment). *The House of Falkland, Fyfe; and Naval and Military Club, W.*
1862		Hamilton, Archibald, Esq. *South Barrow, Bromley, Kent.*
1861		Hamilton, Lord Claude, 19, *Eaton-square, S.W.; and Barons-court, County Tyrone.*
1830		*Hamilton, Captain Henry G., R.N. 71, *Eccleston-square, S.W.*
1876		Hamilton, Jno. G. C., Esq. 54, *Eaton-place, S.W.*
1869		Hamilton, Captain Richard Vesey, R.N. *Pembroke Dockyard, South Wales.*
1861		Hamilton, Col. Robert Wm. (Grenadier Guards). *Guards' Club, Pall-mall, S.W.*
1863		Hamilton, Rowland, Esq. *Oriental Club, W.*
1872		Hamilton, Walter, Esq. 13, *Mitre-court-chambers, Temple, E.C.*
1846		Hamilton, Rear-Admiral W. A. Baillie. *Macartney-house, Blackheath, S.E.*
1876	1300	*Hammond, Navig.-Lieut. G. C., R.N. *Care of the Hydrographic-office, Admiralty, S.W.*
1853		Hampton, Lord, F.R.S. 41, *Eaton-square, S.W.; and Westwood-park, Droitwich, Worcestershire.*
1874		Hanbury, R. W., Esq., M.P. *Ilam-hall, Ashbourne, Derbyshire.*
1876		Hancock, E. H., Esq. *Leigh-villa, The Avenue, Surbiton.*
1853		*Hand, Admiral George S., C.B. *U. S. Club, S.W.*
1860		*Handley, Benjamin, Esq. 56, *Eland-road, Lavender-hill, S.W.*
1874		Handley, Captain Francis (late I.N.). *Brighton Club,* 55, *Old Steine, Brighton.*
1866		Hanham, Commr. T. B., R.N. *Manston-house, near Blandford, Dorset.*
1861		*Hankey, Blake Alexander, Esq.
1874		Hankey, Reginald, Esq. 71, *Chester-square, S.W.; and Arthur's Club, S.W.*
1870	1310	*Hankey, Rodolph Alexander, Esq. 54, *Warwick-square, S.W.*
1857		Hankey, Thomson, Esq. 45, *Portland-place, W.*
1837		*Hanmer, Lord, F.R.S. 59, *Eaton-place, S.W.; and Hanmer-hall and Bettisfield-park, Flintshire.*
1874		*Hanmer, Philip, Esq., B.A. *Christchurch, New Zealand.*
1859		*Hansard, Henry, Esq. 13, *Great Queen-street, W.C.*

Year of Election.	
1875	Hanson, R. B., Esq., M.A. *St. Saviour's Grammar-school, Southwark.*
1874	Harberton, Viscount. 60, *Rutland-gate, S.W.*
1870	Harbord, Rev. John B., M.A. *Athenæum Club, Pall-mall.*
1840	*Harcourt, Egerton V., Esq. *Whitwell-hall, Yorks.*
1864	*Hardie, Gavin, Esq. 113, *Piccadilly, W.*
1864	1320 Harding, Major Charles. *Grafton Club,* 10, *Grafton-street, Piccadilly, W.*
1864	Harding, J. J., Esq. 1, *Barnsbury-park, Islington, N.*
1864	Hardinge, Capt. E., R.N. 32, *Hyde-park-square, W.*
1877	Hare, Evan Herring, Esq. *St. John's-precincts, Putney, S.W.*
1875	Harford, Lieut. Henry Charles (99th Regiment). *Carrick-on-Suir.*
1871	*Hargrave, Joseph, Esq. *Fort Garry, Winnipeg, Manitoba, Canada. Care of the Hudson Bay Company,* 1, *Lime-street, E.C.*
1874	Hargreaves, William, Esq. *Dartmouth-grove, Blackheath, S.E.*
1873	Harley, Colonel R. W., C.B., C.M.G. *Tobago.*
1868	Harper, J. A. W., Esq.
1873	Harper, W. H., Esq. *New Shoreham, near Brighton.*
1871	1330 Harris, Edwd., Esq. *Rydal-villa, Longton-grove, Upper Sydenham.*
1853	Harris, Admiral the Hon. Sir E. A. J., K.C.B. *H.B.M.'s Envoy Extraordinary and Minister Plenipotentiary, The Hague, Holland. Messrs. Woodhead and Co.*
1869	Harris, Capt. G. F. (20th Regt.).
1859	Harris, Capt. Henry, H.C.S. 35, *Gloucester-terrace, Hyde-park, W.*
1865	Harris, John M., Esq.
1874	Harris, Reader, Esq. *Temple Club, Arundel-street, Strand, W.C.*
1863	Harrison, Charles, Esq. 3, *Great Tower-street, E.C.*
1870	Harrison, Charles, Esq. 10, *Lancaster-gate, W.*
1865	*Harrison, William, Esq., F.S.A., F.G.S., &c. *Conservative Club, S.W.; Royal Thames Yacht Club,* 7, *Albemarle-street, W.; and Samlesbury-hall, near Preston, Lancashire.*
1838	Harrowby, Dudley, Earl of, F.R.S. *Sandon-house, Lichfield; and Norton, Gloucestershire.*
1872	1340 Harston, Edward F. B., Esq.
1872	Hart, Frederick Ralph, Esq., F.R.S.A., Membre de la Société de Géographie de Paris, &c.; Mem. Pure Literature Soc., London. *Government-house, Trinidad, British West Indies. Care of Messrs. Sieveking, Droop, and Co.,* 7, *Crosby-square, E.C.*
1873	Hart, Henry Neville, Esq. 107, *Harley-street, W.*
1875	Hart, James, Esq. *Winslow-house, South Norwood.*
1868	*Hart, J. L., Esq. 20, *Pembridge-square, W.*
1854	*Hartland, F. Dixon-, Esq., F.S.A., &c. 14, *Chesham-place, S.W.; and the Oaklands, near Cheltenham.*
1874	Hartley, Sir Chas. Aug., F.R.S.E., &c. *Reform Club, Pall-mall, S.W.*
1874	Hartnell, Rev. Bedford, M.A. *Clifton College, Bristol.*
1875	Harvey, Alex. S., Esq., H. M. C. Shanghai. 228, *Union-street, Aberdeen.*
1875	Harvey, Aug. Jno., Esq. 1, *South-bank, Regent's-park, N.W.*

Year of Election.	
1863	1350 Harvey, Charles, Esq. *Rathgar-cottage, Streatham, S.W.*
1867	Harvey, James, Esq. (Solicitor). *Esk-street, Invercargill, Southland, New Zealand. Care of the Bank of Otago, Old Broad-street, E.C.*
1864	Harvey, John, Esq. *Ickwell Bury, Biggleswade.*
1864	Harvey, John, Esq. 7, *Mincing-lane, E.C.*
1869	Harvey, John, Esq., LL.D. *Château Deslyons, Boulogne-sur-Mer.*
1866	Harvey, Richard M., Esq. 13, *Devonshire-street, Portland-place, W.*
1877	*Harvey, Wm. C., Esq. *City Liberal Club*, 71, *Queen-street, Cheapside, E.C.*
1871	*Harvie, Edgar Christmas, Esq. *City of London Club, Old Broad-street.*
1873	Harwood, S., Esq. *Hamilton-house, Leamington.*
1875	Haslam, Aug. Fred., Esq. 14, *Lawn-road, Haverstock-hill, N.W.*
1873	1360 Hatherton, Lord. *Teddesley-park, Penkridge, Staffordshire.*
1875	Haughton, Colonel J. C., C.S.I. *West Farleigh, Maidstone.*
1875	Havilland, Rev. C. R. de. *Iver, near Uxbridge, Bucks.*
1858	Hawker, Edward J., Esq. 37, *Cadogan-place, S.W.*
1873	Hawker, Geo. C., Esq. *Care of Messrs. Hazard and Caldecott*, 1, *New Basinghall-street, E.C.*
1876	Hawkins, Alf. Templeton, Esq. 20, *Great George-street, Westminster, S.W.*
1834	Hawkins, Francis Bisset, Esq., M.D., F.R.S. 146, *Upper Harley-street, W.; and Leweil-lodge, Dorchester.*
1840	*Hawkins, John, Esq.
1858	*Hawkins, Major-General J. Summerfield, R.E. *St. Leonards, St. James's-road, Malvern.*
1876	Hawkins, Rev. Joshua. *The Nest, Howard-road, South Norwood.*
1873	1370 Hawkins, Rev. W. Bentinck L., F.R.S. 33, *Bryanston-square, W.*
1876	*Hawkshaw, Sir John, C.E., F.R.S. 33, *Great George-street, S.W.*
1861	Hawksley, Thomas, Esq., C.E. 14, *Phillimore-gardens, Kensington, W.*
1871	Hay, Andrew, Esq. *Oriental Club, Hanover-square, W.; and Bombay.*
1852	*Hay, Rear-Admiral Sir J. C. Dalrymple, Bart., M.P., F.R.S. 108, *St. George's-square, S.W.; U. S. Club, S.W.; Dunragit, Glenluce; and Harrow-on-the-hill, N.W.*
1863	*Hay, Rear-Admiral Lord John, M.P., C.B. 15, *Cromwell-road, South Kensington, S.W.*
1872	Hay, Jno. Ogilvy, Esq. (Hon. Magist. and J.P. Brit. Burmah). *Rangoon.*
1865	Hay, Lord William. *B* 5, *Albany, W.*
1872	Haydon, G. H., Esq. *Bethlehem Hospital, S.E.*
1874	Hayes, A. A., Esq., jun. *Care of Horace Farquhar, Esq.*, 9, *King William-street, E.C.*
1870	1380 Haynes, Stanley L., Esq., M.D. *Malvern-link, Worcestershire.*
1864	Haysman, James, Esq. *Burgess-hill, Finchley-road, N.W.*
1862	Head, Alfred, Esq. 13, *Craven-hill-gardens, Bayswater, W.*
1871	Head, Henry, Esq. *Stoke Newington, N.*
1871	Head, Geo. T., Esq. *East-cliff-house Grammar-school, Margate.*
1876	Headley, Robert, Esq. 20, *De Beauvoir-square, N.*

Year of Election.	
1874	Heard, Dr. Samuel S. *Derriguni-castle, Kenmare, Ireland; and 14, St. James's-square, S.W.*
1856	Heath, The Baron, F.R.S., F.S.A. 31, *Old Jewry, E.C.*
1863	Heathfield, W. E., Esq. 30, *King-street, St. James's.*
1861	Hector, James, Esq., F.R.S., M.D. *Care of Agent-General for New Zealand, 7, Westminster-chambers, Victoria-street, S.W.*
1873	1390 Heeley, W. E., Esq. *Urban-lodge, Wimbledon-park-road, Wandsworth.*
1876	*Hegan, Chas. John, Esq. *Oxford and Cambridge Club, Pall-mall, S.W.*
1871	Heinemann, N., Esq., PH.D. *Scientific Club, 7, Savile-row, W.*
1872	*Helme, Richard, Esq. *Walthamstow, Essex.*
1862	Hemans, Geo. Willoughby, Esq., C.E. *Westminster-chambers, Victoria-st., S.W.*
1870	Henderson, David Mitchell, Esq. 1, *Carden-place, Aberdeen; and Old Calabar, W. Africa.*
1871	*Henderson, G., Esq., M.D., F.L.S. *Care of Messrs. King and Co., Pall-mall, S.W.*
1874	Henderson, Henry, Esq. 24, *Huntley-road, Elm-park, Liverpool.*
1853	Henderson, John, Esq. 2, *Arlington-street, Piccadilly, W.*
1874	Henderson, Major K. G. *Care of Sir C. MGregor, Bart., and Co.,* 25, *Charles-street, S.W.; and Naval and Military Club, Piccadilly, S.W.*
1866	1400 Henderson, Patrick, Esq. *Care of George Reid, Esq.,* 21, *Abchurch-lane, E.C.*
1876	*Henderson, P. L., Esq. 14, *Fenchurch-street, E.C.*
1875	Heneage, Charles, Esq. *St. James's Club, Piccadilly, W.*
1844	*Heneage, Edward, Esq. *Stag's-end, Hemel Hempstead.*
1860	Hennessey, J. B. N., Esq. *1st Asst. Trig. Survey of India, Dehra Dhoon. Care of Messrs. H. S. King and Co., Cornhill, E.C.*
1875	Henriques, Alfred G., Esq. 96, *Gloucester-terrace, Hyde-park, W.*
1838	*Henry, Wm. Chas., Esq., M.D., F.R.S. *Haffield, near Ledbury, Herefordshire.*
1861	*Henty, Douglas, Esq. *Chichester.*
1872	Herbert, Charles E., Esq. *Oriental Club, Hanover-square, W.*
1875	Herbert, H. Aug., Esq.
1857	1410 Herd, Captain D. J. 2, *Norway-house, Limehouse, E.*
1876	Herries, Edward, Esq., C.B. *Athenæum Club, Pall-mall, S.W.*
1858	Hertslet, Edward, Esq., C.B. *Librarian, Foreign-office, S.W.; and Belle-vue-house, Richmond.*
1871	Hertslet, Geo. Thos., Esq. *Lord Chamberlain's-office, St. James's-palace, S.W.*
1876	Hervey, Lord Francis, M.P. 17, *Clifford-street, W.*
1861	Heugh, John, Esq. *Gaunts-house, Wimborne-minster, Dorset.*
1873	Hewitt, Richard, Esq. *Elmfield, Esher, Surrey.*
1840	*Heywood, James, Esq., F.R.S. *Athenæum Club, S.W.; and* 26, *Kensington-palace-gardens, W.*
1869	Heywood, Samuel, Esq. 171, *Stanhope-street, Hampstead-road, N.W.*
1860	Heyworth, Capt. Lawrence. *Junior United Service Club, S.W.*
1867	1420 Higgins, Edmund Thomas, Esq., M.R.C.S.
1856	Hill, Arthur Bowdler, Esq. *South-road, Clapham-park, Surrey, S.W.*

Year of Election.

1872 Hill, Clement L., Esq. *Foreign-office, S.W.*

1873 Hill, Henry, Esq. 122, *Leadenhall-street, E.C.*

1874 Hill, Capt. Jno., R.E. (Great Trig. Survey of India). *Dehra Dhoon.*

1872 *Hill, Samuel, Esq., M.D. 22, *Mecklenburgh-square, W.C.*

1854 Hill, Colonel Sir Stephen J., K.C.M.G., C.B. *Army and Navy Club, S.W. Care of Capt. E. Barnett,* R.N., 14, *Woburn-square, W.*

1874 Hills, Lieut.-Colonel James, C.B., V.C., R.A. *Care of Messrs. H. S. King and Co., Cornhill, E.C.*

1858 Hinchliff, T. Woodbine, Esq., Barrister-at-Law. 64, *Lincoln's-inn-fields, W.C.*

1862 *Hinde, Samuel Henry, Esq. *Windham Club, S.W.*

1876 1430 Hirst, Walter O., Esq. 11, *Norfolk-street, Manchester,*

1873 Hirst, William Henry, Esq. 103, *Mottram-road, Staleybridge, Cheshire.*

1873 Hirth, Dr. F. *Imperial Maritime Customs, China; and* 8, *Storey's-gate, S.W.*

1870 Hitchins, Capt. T. M., R.A. *Sheerness.*

1872 *Hoare, Henry, Esq. *Hoare's Bank, Fleet-street; and St. James's-square, S.W.*

1868 Hoare, Samuel, Esq. 7, *Hereford-gardens, Park-lane, W.*

1876 Hobart, Major Bertie, R.A. *Care of Miss Hobart,* 20, *Devonshire-place, Eastbourne.*

1876 Hobson, Rev. J. P., M.A. 4, *The Grove, Blackheath; and Worcester College, Oxford.*

1868 Hobson, Stephen James, Esq. 10, *Regent's-park-road, N.W.*

1874 *Hochschild, His Excellency, Baron (Swedish Minister). 2, *Great Cumberland-street, Hyde-park, W.*

1872 1440 Hockin, Charles, Esq., M.A. 8, *Avenue-road, St. John's-wood, N.W.*

1875 Hodder, Edwin, Esq. *Ashford-villa, Willesden, N.W.*

1875 Hodge, Edward W., Esq. *Pendall, Bletchingley, Surrey; and* 4, *Langham-place, W.*

1869 Hodges, Henry, Esq. *Brondesbury-lodge Collegiate-school, Kilburn.*

1856 *Hodgson, Arthur, Esq. *Clapton-house, near Stratford-on-Avon.*

1871 Hodgson, Henry Tylston, Esq. *Harpenden, St. Albans.*

1861 *Hodgson, James Stewart, Esq. 24, *Princes-gardens, S.W.*

1857 Hodgson, Kirkman Daniel, Esq., M.P. 8, *Bishopsgate-street, E.C.*

1869 *Hodgson, William H., Esq. *Treasury-chambers; and* 1, *Whitehall-gardens, S.W.*

1868 Holdich, Lieut. Thos. Hungerford, R.E.

1839 1450 *Holford, Robert S., Esq. *Dorchester-house, Park-lane, W.*

1867 Holland, Rev. Fred. Whitmore. *Evesham, Worcester.*

1861 Holland, Colonel James. *Southside, The Park, Upper Norwood, S.E.*

1863 Holland, Loton, Esq. *The Gables, Osborne-road, Windsor.*

1862 Holland, Robert, Esq. *Stanmore-hall, Great Stanmore, Middlesex.*

1873 Holland, Lieut. Swinton C., R.N. *Care of Messrs. Hildreth and Ommanney,* 41, *Norfolk-street, Strand, W.C.*

1875 *Hollebone, Fredk., Esq. *Ravensbourne-park, Catford-bridge, S.E.*

Year of Election.	
1871	*Hollingworth, Hy. Geo., Esq. *Coppull-vicarage, near Chorley, Lancashire; and 56, Hereford-road, Bayswater, W.*
1876	*Hollist, Captain E. O., R.A. *Holly-house, Plumstead-common.*
1861	Holme, J. Wilson, Esq., M.A. 83, *St. George's-square, S.W.*
1876	1460 Holmes, John, Esq. 9, *Norfolk-road, St. John's-wood.*
1874	Holmwood, T. D., Esq., 7, *Church-terrace, Lee, Kent.*
1839	*Holroyd, Arthur Todd, Esq., M.D., F.L.S. *Master's-office, Sydney, New South Wales. Care of Edgar Howell, Esq., 3, St. Paul's-churchyard, E.C.*
1857	Holroyd, Henry, Esq., Barrister-at-Law. 14, *Kensington-gardens-terrace, W.*
1867	Holstein, The Marquez de Souza. *Lisbon. Care of the Portuguese Legation, 12, Gloucester-place, Portman-square, W.*
1869	Holt, George, Esq. *Union-street, Willenhall.*
1871	Holt, Henry F. W., Esq. *Redgrave, Victoria-road, Clapham-common, S.W. Messrs. King and Co., Cornhill.*
1872	Holt, Lieut. Sydney A., R.N. *Care of Messrs. Hildreth and Ommanney, 41, Norfolk-street, Strand, W.C.*
1864	Holt, Vesey, Esq. 17, *Whitehall-place, S.W.*
1873	Home, Lieut.-Colonel Robert, R.E. 25, *Kidbrooke-road, Blackheath, S.E.*
1857	1470 Homfray, William Henry, Esq. 6, *Storey's-gate, S.W.*
1875	Honeybourne, Jno. W. C., Esq. *St. Ive's Grammar-school, Huntingdonshire.*
1864	Hood, Sir Alex. Acland, Bart. *St. Andrie's-park, Bridgwater, Somerset.*
1873	*Hood, F. Jacomb, Esq. *Conservative Club, S.W.*
1862	Hood, Henry Schuback, Esq. *War-office, S.W.; and* 10, *Kensington-park-gardens, W.*
1866	*Hooker, J., Esq., C.B., M.D., F.R.S., F.L.S., &c. *Director of the Royal Gardens, Kew.*
1868	Hooper, Alf., Esq. *City of London Club, Old Broad-street, E.C.*
1870	Hooper, George Norgate, Esq. 139, *King Henry's-road, Adelaide-road, N.W.*
1870	Hooper, Rev. Robert Poole. 31, *Cambridge-street, Brighton.*
1875	Hooper, Wm. Edwd. Parry, Esq. 29, *St. George's-road, Kilburn, N.W.; and* 17, *New-street, Spring-gardens, S.W.*
1875	1480 Hooper, W. F., Esq.
1861	Hopcraft, George, Esq. 3, *Billiter-square, E.C.*
1846	*Hope, Alex. James Beresford, Esq., M.P. *Arklow-house, Connaught-place, Hyde-park, W.; and Bedgebury-park, Hurst-green, Kent.*
1862	Hope, Capt. C. Webley, R.N. *Messrs. Hallett and Co., St. Martin's-place, W.C.*
1874	Hope, Percy, Esq. *Mosely-buildings, Manchester.*
1869	Hopkins, Capt. David, M.A.I. *H.M. Consul at St. Paulo de Loanda. Care of Mrs. Hopkins, Richmond-villa, Lordship-lane, Dulwich, S.E.*
1870	*Hopkins, Edward M., Esq. 3, *Upper Berkeley-street, Portman-square, W.*
1871	Hornby, Rev. James John, D.D. *Head Master of Eton College.*
1877	Horncastle, W. Geo., Esq. 314, *Regent-street, W.*
1871	Horne, Francis, G. Esq. *Salmons, Caterham, Surrey.*
1876	1490 *Horniman, Fred. Jno., Esq. *Surrey-house, Forest-hill.*

Year of Election.	
1869	*Horrex, Theophilus, Esq. 18, *Connaught-square, Hyde-park, W.*
1876	Horsley, Thomas, Esq. *King's Newton, Derbyshire.*
1868	Horton, James Africanus B., Esq., M.D., &c. *Care of Sir C. McGregor, Bart., and Co., Charles-street, St. James's, S. W.*
1870	Hoseason, Captain John C., R.N. *United Service Club, S. W.*
1861	Hoskins, Capt. A. H., R.N. *Army and Navy Club, S. W. Care of Messrs. Woodhead, 44, Charing-cross, S. W.*
1853	Houghton, Lord, D.C.L., F.R.S. 33, *Bruton-street, W.; Travellers' Club, S. W. The Hall, Bawtry; and Fryston-hall, Ferrybridge, Yorkshire.*
1874	Howard, A. C., Esq. 27, *Devonshire-place, Portland-place, W.; and Arthur's Club, S. W.*
1875	Howard, Alf. Jno., Esq. 1, *Fleet-street, E.C.*
1876	Howard, Charles C., Esq. *Christchurch, Canterbury, New Zealand. Care of Messrs. Stanford, Charing-cross, S. W.*
1869	1500 Howard, John, Esq., C.E. 267, *Goldhawk-road, Shepherd's-bush.*
1875	Howard, Joseph, Esq. *Tottenham-green.*
1873	Howard, Morgan, Esq., Q.C. *Temple, E.C.*
1857	Howard, Samuel Lloyd, Esq. *Goldings, Loughton, Essex.*
1873	Howard, William, Esq. 3, *Roslyn-bank, Lyndhurst-road, Hampstead, N. W.*
1875	Hozier, Capt. Jno. W. (Scots Greys). 11, *Hobart-place, Eaton-square, S. W.*
1842	*Hubbard, Rt. Hon. J. Gellibrand, M.P. 24, *Prince's-gate, Hyde-park, W.*
1867	*Hubbard, William Egerton, Esq. *Leonardslee, Horsham.*
1867	*Hubbard, William Egerton, jun., Esq. *Leonardslee, Horsham.*
1871	*Hudleston, Wilfred, Esq. 23, *Cheyne-walk, S. W.*
1870	1510 Hudson, George B., Esq. *Frogmore-hall, Hertford; and New University Club, St. James's-street, S. W.*
1872	*Hudson, John, Esq. 4, 5, *and* 6, *Great St. Helen's, E.C.; and Thatched-House Club, St. James's, S. W.*
1876	Hughes, A. W., Esq. *Care of F. P. Baker, Esq., 4, Bond-court, Walbrook.*
1857	Hughes, Captain Sir Frederic. *Ely-house, Wexford.*
1875	Hughes, J. Wm., Esq. *Bangor, Carnarvonshire.*
1873	Hughes, James, Esq. 328, *Camden-road, N.*
1876	Hughes, Joseph, Esq. *Pomfret-college, Pontefract.*
1875	Hughes, Capt. W. Gwynne. 14, *St. James's-square, S. W.*
1865	Hughes-Hallett, Capt. F. C. *Junior United Service Club, S. W.*
1875	Hull, Staff-Comm. Thos. A., R.N. *Hydrographic-office, Admiralty.*
1838	1520 *Hume, Edmund Kent, Esq.
1868	Hunt, John Percival, Esq., M.D. 3, *Paradise-place, Green-lanes, N.*
1873	Hunt, John, Esq. 22, *Lancaster-gate, Hyde-park, W.*
1877	Hunt, W. G. Francis, Esq., R.N. *Junior Naval and Military Club, Pall-mall, S. W.*
1874	Hunt, William Thomas, Esq. 1, *Pembridge-villas, Bayswater, W.*
1876	Hunter, Major F. M. (Bombay Staff Corps). *Aden.* 60, *South-street, St. Andrew's, Fifeshire. Care of Messrs. H. S. King and Co., Cornhill, E.C.*

Year of Election.

1875 Hunter, John, Esq. 9, *New-square, Lincoln's-inn, W.C.*

1874 Hunter, Capt. J. Edward, R.N. *Care of Messrs. Hallett and Co., St. Martin's-place, W.C.; and United Service Club, Pall-mall, S.W.*

1872 Hunter, W. W. Esq., LL.D. *Bengal.*

1876 *Huntingford, Lieut. G., R.N. *Care of Rev. Dr. Huntingford, Valley-end, Bagshot.*

1872 1530 Huson-More, James, Esq., M.A. 2, *Brook-street, Cheetham, Manchester.*

1871 Hutchins, F. Leigh, Esq. 22, *Queen's-gardens, Hyde-park, S.W.*

1873 Hutchins, Geo. Albert, Esq. *Felsted Pen, Spanish Town, Jamaica.*

1871 *Hutchinson, Major Alexr. Hadden, R.A., F.G.S. (Garrison Instructor). *Shoeburyness, Essex.*

1872 Hutchinson, Edward, Esq. 8, *Sumner-place, South Kensington, S.W.*

1864 Hutchinson, Capt. R. R. *Junior St. James's Club, St. James's-street, S.W.*

1874 Hyndman, Hy. Mayers, Esq. 10, *Devonshire-street, Portland-place, W.*

1870 *Hutton, Charles W. C., Esq. *Belair, Dulwich, S.E.*

1869 Huxley, Prof. T. H., F.R.S. 4, *Marlborough-place, St. John's-wood, N.W.; and 28, Jermyn-street, S.W.*

1875 Huxtable, The Ven. Archdeacon. *Sutton Waldron, Blandford.*

1860 1540 *Hyde, Captain Samuel. 8, *Billiter-square, E.C.*

1852 Illingworth, Richard Stonhewer, Esq. 9, *Norfolk-crescent, Hyde-park, W.*

1875 Impey-Lovibond, Col. Archibald, R.E. *"Riffhams," Danbury, near Chelmsford, Essex.*

1850 *Imray, James Frederick, Esq. 89, *Minories, E.; and Beckenham, Kent.*

1861 *Ingall, Samuel, Esq. *Forest-hill, Kent, S.E.*

1851 Inglefield, Admiral Edward A., C.B., F.R.S. *United Service Club, S.W.; and 99, Queen's-gate, S.W.*

1871 Inglis, Commander Charles D., R.N. 93, *Finborough-road, South Kensington, S.W.*

1846 Ingram, Hughes Francis, Esq. *University Club, S.W.*

1860 *Inskip, Capt. G. H., R.N. 1, *Huntiscombe-place, North-road, Plymouth.*

1852 *Inskip, Rev. Robert Mills, C.B. 1, *Huntiscombe-place, North-road, Plymouth.*

1877 1550 Inverarity, Geo., Esq. 13, *Stanhope-gardens, W.*

1875 Inverurie, Fras. Alex., Lord. *Keith-hall, Aberdeenshire; and Carlton Club, Pall-mall.*

1840 *Irby, Frederick W., Esq. *Athenæum Club, S.W.*

1870 Irvine, James, Esq. 18, *Devonshire-road, Claughton, Cheshire.*

1875 Irving, Rev. Henry. 1, *Norfolk-place, Child's-hill, Kilburn, N.W.*

1864 *Irving, John, Esq. *Care of Messrs. Ebsworth and Sons, 4, Corbet-court, Gracechurch-street, E.C.*

1861 Irwin, James V. H., Esq. 5, *Alpha-place, St. John's-wood, N.W.*

Year of Election.	
1873	Jackson, F. H. Ward, Esq. 9, *Albion-street, Hyde-park, W.*
1871	Jackson, Henry, Esq., Lieut. late I.N. (Chief Surveyor of the Province of Wellington). *New Zealand.*
1871	Jackson, Richd. Belgrave, Esq. 16, *Addison-terrace, Kensington, W.*
1866	1560 Jackson, Robert Ward, Esq. 136, *Inverness-terrace, Hyde-park, W.*
1871	Jackson, Thos. Hughes, Esq. *Manor-house, Birkenhead.*
1855	Jackson, William, Esq. 44, *Portland-place, W.*
1871	Jackson, Wm. Chas., Esq. *Universities Club,* 71, *Jermyn-street, S.W.*
1862	Jacomb, Thomas, jun., Esq. 23, *Old Broad-street, Gresham-house, E.C.*
1875	Jagg, Rev. F. Charles. *Faversham, Kent.*
1861	James, William Bosville, Esq. 13, *Blomfield-road, Maida-hill, W.*
1870	James, William Morris, Esq. 8, *Lyndhurst-road, Hampstead, N.W.*
1868	Jamieson, Hugh, Esq. *Junior Carlton Club, S.W.*
1862	*Jaques, Leonard, Esq. *Wentbridge-house, Pontefract, Yorkshire.*
1863	1570 *Jardine, Andrew, Esq. *Lanrick-castle, Stirling.*
1863	*Jardine, Robert, Esq. *Castlemilk, Lockerby, N.B.*
1875	*Jardine, Robert, Esq. 21, *Queensbury-place, South Kensington, S.W.*
1871	Jarrad, Lieut. F. W., R.N. *Care of Edw. M. Roe, Esq., Royal Hospital Schools, Greenwich.*
1876	Jarvis, F. C., Esq. 11, *Fitzroy-square, W.*
1876	Jeakes, Rev. James. 54, *Argyll-road, Kensington, W.*
1872	Jeffreys, A. F., Esq. *Fernhill, Bournemouth; and* 1, *Dr. Johnson's-buildings, Temple, E.C.*
1865	Jeffreys, J. Gwyn, Esq., LL.D., F.R.S. *Ware-priory, Herts.*
1876	Jeffries, Wm. H., Esq. 111, *Southgate-road, Islington, N.*
1875	Jeffs, Richard, Esq. 244, *Regent-street, W.*
1860	1580 *Jejeebhoy, Sir Jamsetjee, Bart. *Bombay.*
1854	Jellicoe, Charles, Esq. 12, *Cavendish-place, W.*
1854	Jenkins, Capt. Griffith, I.N., C.B. *East India United Service Club, St. James's-square, S.W.; and Little Garth, Welshpool, Montgomeryshire.*
1837	*Jenkins, R. Castle, Esq. *Beachley, near Chepstow.*
1877	Jenkins, Commander R. P., R.N. 7, *Spencer-villas, St. James's-road, Croydon.*
1874	*Jenkinson, H. Irwin, Esq. *Keswick, Cumberland.*
1875	Jennings, Samuel, jun., Esq. 58, *Granville-park, Blackheath.*
1854	*Jennings, William, Esq., M.A. 13, *Victoria-street, Westminster, S.W.*
1876	Jephson, Mountney, Esq. *Garrick Club, Garrick-street, W.C.*
1874	Jeppe, Le Chevalier Fred. *Care of Portuguese Consulate,* 8, *St. Mary Axe, E.C.*
1860	1590 Jermyn, Rowland Formby, Esq. *War-office, S.W.*
1873	Jervis, Theodore, Esq. 48, *Vincent-square, S.W.*
1870	Jessop, Captain Thomas. *Honley, Huddersfield.*
1860	Jessopp, Rev. Augustus, M.A., Head Master, King Edward VI. School. *Norwich.*
1864	*Jeula, Henry, Esq. *Lloyd's, E.C.*
1874	Jeune, Fras. H., Esq. 3, *Howick-place, Victoria-street, S.W.; and* 1, *Harecourt, Temple, E.C.*

Year of Election.	
1876	Joaquim, J. P., Esq. *Care of W. B. D'Almeida, Esq., 2, Pump-court, Middle-Temple, E.C.*
1873	Jocelyn, Hon. W. Nassau. *Care of Foreign-office, S.W.*
1876	Johnson, F. Bulkeley, Esq. 5, *The Mount, St. Leonards-on-Sea; and Devonshire Club.*
1859	*Johnson, Henry, Esq. *Worthing, Sussex.*
1876	1600 Johnson, Joseph, Esq. 12, *Carleton-road, Tufnell-park, N.*
1876	Johnson, Murray, Esq. 20, *Austin Friars, E.C.*
1866	Johnson, W. H., Esq., Civil Assistant G. T. S. India.
1875	*Johnston, A., Esq. 18, *Paternoster-row, E.C.*
1868	*Johnston, Alexander Keith, Esq. 4, *Glester-road, Kew.*
1876	Johnston, Chas. Edwd., Esq. 6, *Palace-gate, W.*
1874	*Johnston, Capt. H. B. *United Service Club, Dublin; and Junior Carlton Club, Pall-mall, S.W.*
1857	Johnston, J. Brookes, Esq. 29, *Lombard-street, E.C.*
1875	Johnston, Robert, Esq. 29, *Gardiner's-place, Dublin.*
1871	Johnston, T. B., Esq., F.R.S.E. 4, *St. Andrew-square, Edinburgh.*
1866	1610 Johnstone, Colonel H. C., C.B., F.R.A.S. *Murree, Punjaub, India. Care of Messrs. H. S. King and Co., Cornhill, E.C.*
1867	*Johnstone, John, Esq. *Castelnau-house, Mortlake, S.W.*
1874	Johnstone, M. Butler, Esq., M.P. 8, *Seamore-place, Mayfair. W.*
1873	Johnstone, W. Woods, Esq., M.D. 44, *Prince's-square, W.*
1872	Jolley, Rev. Wm. Rowe, M.A. Hon. Chaplain to the Queen. *North Repps-rectory, Norwich.*
1875	Jones, Arthur W., Esq. 10, *Eaton-square, S.W.*
1874	Jones, Edwin, Esq. (Mayor of Southampton). *Fairlea, Bassett, Southampton.*
1864	Jones, Capt. Felix (late I.N.). *Fernside, Church-rd., Westow-hill, Upper Norwood.*
1876	Jones, Hugh H., Esq. *Larkhill, Liverpool.*
1868	Jones, Captain H. M., V.C. *Care of Messrs. Bickers and Son, 1, Leicester-square, W.C.*
1857	1620 Jones, Lieut.-Col. Jenkin (Royal Engineers).
1862	Jones, John, Esq. 338, *Strand, W.C.*
1873	Jones, Rev. John. 11, *Petherton-road, Canonbury.*
1872	Jones, Staff-Commander Jno., R.N. *The Blue Bell, Welshpool, Montgomeryshire.*
1871	Jones, Robert, Esq. *Glanbrane-park, Llandovery, Carmarthenshire.*
1876	Jones, Rev. W. Taylor. *The College, Sydenham.*
1861	Jones, Sir Willoughby, Bart. *Cranmer-hall, Fakenham, Norfolk.*
1873	Jones, Winslow, Esq. *Devon and Exeter Institution, Exeter.*
1867	*Jordan, Wm. Leighton, Esq. 1, *Powis-square, Notting-hill, W.*
1863	*Joshua, Moss, Esq. *Bishopshalt, Hillingdon.*
1876	1630 *Joyner, Henry Batson, Esq., C.E. *Yamato Yashiki, Tokei, Japan. Care of H. S. J. Joyner, Esq., Northwick-house, Harrow.*
1876	*Jupe, Jno., Esq. *Lloyd's, E.C.*

Year of Election.	
1873	Kane, Dr. William. *Care of M. Kane, Esq.*, M.D., *Sunninghill, Kingston-hill.*
1876	Kane, Dr. Matthew, M.D. *Sunninghill, Kingston-hill.*
1868	Kantzow, Capt. H. P. de, R.N. 1, *Observatory-gardens, Campden-hill-road, W.*
1877	Karuth, Frank Oscar, Esq. *Oakhurst, The Knoll, Beckenham, Kent.*
1875	Kavanagh, T. Frank P., Esq. *Bedford-hotel, Covent-garden.*
1858	Kay, David, Esq. 19, *Upper Phillimore-place, Kensington, W.*
1876	Kay, H. C., Esq. 11, *Durham-villas, Kensington, W.*
1857	*Keating, Hon. Sir Henry Singer. 11, *Prince's-gardens, S.W.*
1873	1640 *Keightley, Alfred D., Esq. *Milnthorpe, Penrith, Westmoreland.*
1875	Keir, Campbell M., Esq. *Oriental Club, Hanover-square, W.*
1875	Keir, Jno. Lindesay, Esq. 92, *Gloucester-terrace, Hyde-park, W.*
1863	Keir, Simon, Esq. *Conservative Club, S.W.*
1874	Keller, M. Franz, C.E. *Carlsruhe.*
1860	*Kemball, Maj.-Gen. Sir Arnold Burrowes, K.C.S.I., C.B. *United Service Club, S.W.*
1869	Kemp, Geo. L., Esq., Calcutta. *Care of Messrs. H. S. King and Co.*, 65, *Cornhill, E.C.*
1873	Kemp, Rev. Henry William, B.A. *The Charter-house, Hull.*
1863	Kempster, J., Esq. 1, *Portsmouth-place, Kennington-lane, Surrey, S.E.*
1861	Kennard, Adam Steinmetz, Esq. *Crawley-court, Winchester.*
1877	1650 Kennard, James, Esq. *Noonsun-house, Stacksteads, Manchester.*
1877	*Kennaway, Sir John H., Bart. *Escot, Ottery St. Mary, Devon.*
1871	Kennedy, Henry Hyndham, Esq. *Union Club, S.W.*
1874	Kennedy, John, Esq., M.D. *East India United Service Club*, 14, *St. James's-square, S.W.*
1875	Kennedy, John, Esq. 13, *Brooklyn-road, Shepherd's-bush, W.*
1854	Kennedy, Rev. John, M.A. 27, *Stepney-green, E.*
1875	Kennedy, Rear-Admiral Jno. Jas., C.B. 1, *Cromwell-place, South Kensington, S.W.; and United Service Club, Pall-mall.*
1875	Kennedy, Colonel J. P., R.E. 66, *St. George's-square, S.W.*
1871	Kennion, Rev. George Wyndham, B.A. *All Saints'-vicarage, Bradford, Yorkshire.*
1875	Kent, Fras. A., Esq. *Kesgrave-hall, Suffolk.*
1872	1660 Kerr, Alexander, Esq. (Banker), Wellington, New Zealand. *Care of Norman S. Kerr, Esq.*, M.D., 42, *Grove-road, St. John's-wood, N.W.*
1863	Kerr, Staff-Commr. J. H., R.N. *Hydrographic-office, S.W.*
1874	Kerr, Major-General, Lord Mark, C.B. 18, *James-street, Buckingham-gate, S.W.*
1862	Kershaw, Wm., Esq. 16, *St. Mary Axe, E.C.; and Suffolk-lodge, Brixton-road, S.W.*
1875	*Kettle, Daniel W., Esq. *Hayes-common, Beckenham; and* 53, *Fleet-street, E.C.*
1876	*Kettle, H. A., Esq. *Hayes-common, Beckenham, Kent.*
1857	Keysell, Francis P., Esq. *Grove-house, Cheshunt.*
1864	*Kiddle, Staff-Commr. W. W. 70, *Upper Leeson-street, Dublin.*

Year of Election.

1874 Killam, Frank, Esq. *Yarmouth, Nova Scotia.*

1864 Kimber, Dr. E. 13, *Park-villas, Shepherd's-bush, W.*

1874 1670 Kincaid, Thomas, Esq. 9, *Lansdown-crescent, Glasgow.*

1875 King, E. H., Esq. *Killcott, Godalming, Surrey.*

1846 King, Lieut.-Colonel Edward R. *Junior United Service Club, S.W.*

1870 King, Henry S., Esq. J.P. 65, *Cornhill, E.C.; 45, Pall-mall, S.W.; Manor-house, Chigwell, Essex; and Junior Carlton Club, S.W.*

1872 King, James, Esq. 12, *Claremont-terrace, Glasgow.*

1866 King, John, Esq. *Compton-field-place, Guildford, Surrey.*

1874 King, Hon. J. P. Locke. 38, *Dover-street, W.; and Brooklands, near Weybridge, Surrey.*

1873 *Kingsley, Maurice, Esq.

1857 *Kinnaird, Hon. Arthur F., M.P. 2, *Pall-mall-east, S.W.*

1867 Kinnaird, George William Fox, Lord, K.G. *Rossie-priory, Inchture, N.B.; and 33, Grosvenor-street, W.*

1858 1680 Kirk, John, Esq. M.D., H.M. Agent and Consul General, *Zanzibar.*

1863 Kirke, John, Esq., Barrister. *Oriental Club, W.*

1870 Kirkland, Major-Gen. John A. Vesey. *Wester Fordel, Milnathort, N.B.*

1868 Kisch, Daniel Montagu, Esq. 15, *Westbourne-park-terrace, W.*

1875 Kitchener, Lieut. H. H. *Care of W. Besant, Esq., 9, Pall-mall-east, S.W.*

1866 *Kitson, James, jun., Esq. *Spring-bank, Headingley, Leeds.*

1868 Kitto, Richard L. Middleton, Esq. *Preston-lodge, Prestonpans, N.B.*

1867 Knight, Andrew Halley, Esq. 62, *Holland-park, W.*

1875 Knight, Jno., Esq. *Care of Messrs. Swinburne and Parker, Bedford-row, W.C.*

1867 Knight, Wm. Duncan, Esq. *Avening-house, Greenhill-park, Hampstead.*

1862 1690 Knollys, General Sir William T., K.C.B. *Eaton-square, S.W.*

1871 Knollys, Major W. W. (93rd Highlanders.) *Woolwich.*

1874 Knowles, George, Esq., C.E. 11, *Queen's-gardens, Hyde-park, W.*

1867 Knox, Alex. A., Esq. 91, *Victoria-street, Westminster, S.W.*

1861 Knox, Thomas G., Esq. *India. Care of Messrs. H. S. King and Co.*, 45, *Pall-mall, S.W.*

1875 Koppel, S., Esq. 64, *Kensington-gardens-square, W.*

1866 Kopsch, Henry, Esq. *Custom-house, Shanghai, and 6, Storey's-gate, S.W.*

1876 Kurnalkur, Abdul Hakk (extra Assist.-Commissioner). *Basim, Berar, India.*

1861 Kyd, Hayes, Esq., M.R.C.S. *Wadebridge, Cornwall.*

1875 Kynaston, Rev. Herbert. *Montpellier-lodge, Cheltenham.*

1589 1700 Labrow, Lieut. Colonel Valentine H., F.S.A., F.G.S. *Mitre-court-chambers, Temple, E.C.; and Club-chambers, S.W.*

1849 *Laffan, Colonel Robert Michael, R.E. *Army and Navy Club, S.W.*

1876 Lafone, Alfred W., Esq. *Holland-lodge, Hanworth, Middlesex.*

Year of Election.	
1870	Laing, Arthur, Esq. 29, *Mincing-lane, E.C.*
1875	Laing, Joseph, Esq, 17, *Castelnau-villas, Barnes, S.W.*
1877	Laing, Robert A., Esq. 3, *St. Peter's-road, Croydon.*
1869	Lamb, Hon. Edward William. *Brisbane, Queensland, Australia.*
1859	Lamb, Lieut. Henry, I.N. *H.M. India Store Department, Belvedere-road, Lambeth, S.E.*
1863	*Lambert, Alan, Esq. *Heath-lodge, Putney-heath, S.W.*
1875	*Lambert, Cowley, Esq. *New University Club, St. James's-street, S.W.*
1876	1710 Laming, James, Esq. 1, *Bryanston-place, Bryanston-square, W.*
1861	Lamont, James, Esq. 4, *Queen-street, Mayfair, W.*
1870	Lamplough, Charles Edward, Esq. *City of London Club, E.C.*
1866	Lampray, John, Esq. 16, *Camden-square, N.W.*
1864	Lampson, Sir C. M., Bart. 80, *Eaton-square, S.W.*
1838	*Lance, John Henry, Esq., F.L.S. *The Holmwood, Dorking.*
1876	*Landsell, Rev. Henry. *The Grove, Blackheath, S.E.*
1859	*Lange, Sir Daniel A. 21, *Regent-street, S.W.*
1856	*Langler, John R., Esq., B.A. 1, *Thurlow-street, Thurlow-park-road, Tulse-hill, S.W.*
1865	Langley, Edward, Esq. *Well-hall, Eltham, Kent.*
1871	1720 Langworthy, Edward, Esq.
1870	Lanyon, Charles, Esq. 3, *Paper-buildings, Temple, E.C.*
1833	*Larcom, Major-General Sir Thomas Aiskew, Bart., R.E., K.C.B., F.R.S. *Heath-field, Fareham, Hants.*
1872	Larcom, Lieut. T. H. *Care of Messrs. Stilwell, 22, Arundel-street, W.C.*
1861	Lardner, Colonel John. *United Service Club, S.W.*
1873	Large, Robert Emmott, Esq. *Vernon-lodge, Teddington; and* 13, *South-square, Gray's-inn, W.C.*
1859	Larnach, Donald, Esq. 21, *Kensington-palace-gardens, W.*
1870	Lasseter, Frederic, Esq. 5, *Porchester-gate, Hyde-park, W.*
1870	Laughton, Lieut.-Col. George Arnold, Bombay Staff Corps, Superintendent Bombay Survey, *Bombay.*
1869	Laughton, J. K., Esq. *Royal Naval College, Greenwich.*
1876	1730 *Laurie, Peter Geo., Esq. 9, *Arundel-gardens, Kensington-park, W.*
1876	Lavies, Joseph Samuel, Esq. 11, *Warwick-square, S.W.*
1873	Law, Geo., Esq. 544, *Oxford-street, W.C.*
1846	*Law, Hon. H. Spencer, M.A. 36, *Eccleston-square, S.W.*
1873	Law, Jas., Esq. 544, *Oxford-street, W.C.*
1874	*Lawes, Robert Murray, Esq. 9, *Clarges-street, Piccadilly, W.*
1870	Lawrence, Alexander, Esq. *Clyde-house, Thurlow-road, Hampstead; and Windsor-chambers, Great St. Helen's, E.C.*
1876	Lawrence, A. M. Esq., jun. 17, *Thurlow-road, Hampstead.*
1874	Lawrence, Fred. W., Esq. *Oakleigh, Beckenham, Kent.*
1876	Lawrence, Hon. John Hamilton. 34, *Beaufort-gardens, S.W.*

Year of Election.	
1877	1740 Lawrence, Sir J. J. Trevor, Bart. 9, *Prince's-gate, S.W.; and Burford-lodge, Dorking, Surrey.*
1870	Lawrence, Lord, G.C.B., G.C.S.I. 26, *Queen's-gate, S.W.*
1870	*Lawrence, Philip Henry, Esq. 33, *Chancery-lane, W.C.*
1873	Lawrence, W. F., Esq. *New University Club, S.W.*
1873	Lawrence, W. L., Esq. *Sevenhampton-manor, Andoversford, Gloucester.*
1868	Lawrie, James, Esq. 63, *Old Broad-street, E.C.*
1867	Lawson, William, Esq. 21, *Walham-grove, Fulham, S.W.*
1862	*Lay, Horatio N., Esq. 8, *Cambrian-villas, Queen's-road, Richmond.*
1857	Layard, Right Hon. Austen H., D.C.L., H.M.'s Envoy Extraordinary and Minister Plenipotentiary, *Madrid.*
1876	Layard, Capt. Brownlow E. *Sheet-street, Windsor.*
1866	1750 *Layard, Captain Brownlow Villiers, 3rd West India Regt. *Junior United Service Club; and* 38, *Upper Mount-street, Dublin.*
1863	*Leaf, Charles J., Esq. *Old Change, E.C.; and The Rylands, Norwood, S.E.*
1875	*Leake, Luke S., Esq. *Perth, Western Australia.*
1875	Leared, Dr. Arthur. 12, *Old Burlington-street, W.*
1874	Leared, Jno., Esq. 12, *Old Burlington-street, W.*
1874	Learmonth, Andrew James L., Esq. *Junior United Service Club, S.W.*
1876	Learmonth, Thos. Livingstone, Esq. 45, *Gloucester-gardens, W.*
1873	Leaver, J. Cristopher, Esq., *Rostherne-house, Castlenau, Barnes, Surrey.*
1866	Lebour, G. A., Esq. *Weedpark-house, Dipton, Lintz-green, Durham.*
1853	*Le Breton, Francis, Esq. 21, *Sussex-place, Regent's-park, N.W.*
1861	1760 Leckie, Patrick C., Esq. 7, *Palace-road, Roupell-park, Streatham, S.W.*
1870	Lecky, Capt. Squire Thornton Stratford, Royal Naval Reserve. 171, *Duke-street, Liverpool.*
1875	Lee, Albert, Esq. 16, *Wellington-st., Preston New-road, Blackburn, Lancashire.*
1877	Lee, Henry, Esq., F.L.S., &c. *The Waldrons, Croydon.*
1868	Lee, John, Esq. *Grosvenor-cottage, Versailles-road, Anerley, S.E.*
1873	Lee, John Dunkin, Esq. *Northwood-park, Cowes, Isle of Wight.*
1874	Leeman, George, Esq., M.P. 7, *Dean's-yard, Westminster, S.W.*
1874	Leeman, Rev. W. L. 16, *Trinity-place, Windsor.*
1869	*Lees, Lieutenant-Colonel Nassau, D.C.L. *Athenæum Club, S.W.*
1865	Le Feuvre, W. H., Esq., C.E. 68, *Bedford-gardens, Kensington, W.*
1833	1770 *Lefevre, Sir John George Shaw, M.A., D.C.L., F.R.S. 18, *Spring-gardens, S.W.*
1853	Lefroy, General John Henry, R.A., F.R.S. *Athenæum Club, S.W.*
1862	Leggatt, Clement Davidson, Esq. 1, *Pinner's-court, Old Broad-street, E.C.*
1861	Legh, William John, Esq. 38, *Belgrave-sq., S.W.; and Lyme-park, Cheshire.*
1861	*Lehmann, Frederick, Esq. 15, *Berkeley-square, W.*
1845	Leigh, John Studdy, Esq., F.G.S. 6, *Talbot-road, Westbourne-park, W.*
1869	Leigh, Roger, Esq. *Burh[illegible]n-court; and Hindley-hall, Hindley.*
1863	Le Mesurier, Henry P., Esq., C.S.I., C.E. 21, *Stanley-crescent, Kensington-pk., W.*
1874	Le Pays, Geo. Renatus, Esq. 38, *Brunswick-terrace, Brighton; and Thatched-House Club, S.W.*

Year of Election.		
1873		Leslie, William, Esq. *Warthill, Aberdeenshire, N.B.; and Carlton Club, Pall-mall, S.W.*
1867	1780	L'Estrange, Carleton, Esq. *Carlton Club, S.W.*
1876		Lethbridge, Edwin B., Esq. 42, *Coleman-street, Brighton.*
1873		Letts, Thomas, Esq. 2, *Crown-buildings, Queen Victoria-street, E.C.*
1876		Lever, J. O., Esq. 97, *St. George's-square, S.W.*
1857		Leverson, George B. C., Esq. 18, *Queensberry-place, Cromwell-road, S.W.*
1876		Leverson, Lieut. Julian Jno., R.E. 18, *Queensberry-place, Cromwell-road, S.W.*
1869		Leveson, Edward J., Esq. *Cluny, Crescent-wood-road, Sydenham-hill, S.E.*
1873		Levi, Professor Leone, F.S.A., &c., Doc. Pol. Econ. Univ. Tub. 19, *Richmond-crescent, Barnsbury, N.; and* 5, *Crown Office-row, Temple, E.C.*
1874		Levin, Nathaniel, Esq. 44, *Cleveland-square, W.*
1859		Levinsohn, Louis, Esq. *Vernon-house, Clarendon-gardens, Maida-hill, W.*
1876	1790	Levy, B. W., Esq. 19, *St. Helen's-place, E.C.*
1873		*Lewin, Frederick Dealtry, Esq. *Morelands, St. John's-park, Blackheath, S.E.*
1877		Lewin, F. Geo., Esq. 4, *Lombardian-villas, St. Mary's-road, Peckham, S.E.*
1869		*Lewin, Capt. Thomas (Beng. Staff Corps). 50, *Eaton-square, S.W.*
1876		Lewis, Francis T., Esq. 26, *Gresham-street, E.C.*
1872		Lewis, Jos., Esq., R.N. *Castle Carrow, Carrick-on-Shannon.*
1874		Lewis, Rev. R. C., M.A. *Streatham-common, S.W.*
1852		Leycester, Captain Edmund M., R.N. *White-place, near Maidenhead, Berks.*
1876		Leyland, R. Watts, Esq. 17H *Exchange-buildings North, Liverpool.*
1859		Lichfield, Thomas George, Earl of. *Shugborough, Staffordshire.*
1872	1800	Liebenrood, Captain J., R.N. *Belmont-lodge, Lee, Kent.*
1870		Light, Rev. John. 13, *Notting-hill-terrace, W.*
1856		Lilford, Thomas Lyttleton Powys, Lord. *Lilford-park, Oundle, Northamptonshire.*
1875		Lillingston, Lieutenant F. G. Innes, R.N. *Coillemore-house, Lochalsh, Ross-shire.*
1860		Lindsay, H. Hamilton, Esq. *Windham-place, Bryanston-square.*
1870		Lindsay, Lord., M.P. 47, *Brook-street, Grosvenor-square, W.*
1867		*Lindsay, Colonel Robert J. L., M.P., V.C. *Lockinge-house, Wantage, Berks; and* 2, *Carlton-gardens, S.W.*
1855		*Lindsay, William S., Esq. *Manor-house, Shepperton, Middlesex.*
1869		Lindsey, Mark John, Esq. 32, *Ludgate-hill, E.C.; and Burnt-ash-lane, Lee, Kent.*
1875		Lister, Isaac S., Esq. *The Heath, Hampstead, N.W.*
1866	1810	Little, Archibald J., Esq. *Shanghai; and* 18, *Park-street, Grosvenor-square, W.*
1871		Little, Simon, Esq. *Calantra-house, Wexford, Ireland.*
1876		Littledale, Clement St. George, Esq. *Highfield, near Liverpool.*
1870		Littleton, The Hon. Henry S. *Teddesley, Penkridge, Staffordshire.*
1875		Littleton, Hon. Wm. F. 3, *Clifford-street, W.*
1875		Lloyd, Capt. C. Henry. *Care of Jno. Jupp and Co.,* 113, *Fenchurch-street E.C.*
1874		Lloyd, Francis Aylmer, Esq. 23, *Queen's-terrace, Finchley-road, N.W.*

Year of Election.

1857 *Lloyd, Hon. George A. *Sydney, N. S. W.; George-yard, Lombard-street, E.C.*

1873 Lloyd, Percival, Esq. *The Limes, Crouch-hill, Hornsey.*

1863 Lloyd, Sir Thomas Davis, Bart. *United University Club, S.W.; and Bronwydd, Carmarthen.*

1864 1820 *Lloyd, W., Esq. *Myood-house, Wednesbury, Staffordshire.*

1867 Lloyd, Rev. William V., M.A.

1861 Lluellyn, Capt. Richard. 20, *Montagu-square, W.*

1869 Lluellyn, Major William R., R.A. *Royal Artillery, Plymouth.*

1877 *Lobb, John, Esq. 89, *Farringdon-street, E.C.*

1868 Lobley, James Logan, Esq., F.G.S. 59, *Clarendon-road, W.*

1863 Loch, George, Esq. 2, *Westminster-chambers, Victoria-street, S.W.*

1859 Loch, Henry Brougham, Esq. *Government-house, Isle of Man.*

1861 Loch, John Charles, Esq. 2, *Westminster-chambers, Victoria-street, S.W.*

1857 Loch, William Adam, Esq. 8, *Great George-street, Westminster, S.W.*

1874 1830 Lock, Alfred G., Esq. *Roselands, Millbrook, Southampton.*

1864 Locke, John, Esq. 83, *Addison-road, Kensington, W.*

1858 Lockhart, William, Esq., F.R.C.S. 67, *Granville-park, Blackheath, S.E.*

1868 Lockhart, Captain Wm. Stephen Alexander.

1874 *Loder, Edmund Giles, Esq. 42, *Grosvenor-square, W.*

1872 Logan, Sir T. Galbraith, K.C.B., M.D. 40, *Hyde-park-square, W.*

1868 Lomonossoff, M. Alexis de. *Assist.-Sec. Geographical Society, St. Petersburg. Care of Messrs. Hamilton and Co.*, 32, *Paternoster-row, E.C.*

1860 * Londesborough, Wm. Henry Forester, Lord. 28, *Berkeley-square, W.*

1873 Longbottom, A. P., Esq., C.E.

1830 *Long, George, Esq., M.A. 2, *Rhine-villas, Portfield, Chichester.*

1874 1840 Long, Rev. James. 14, *Salisbury-square, Fleet-street, E.C.*

1857 *Long, W. Beeston, Esq.

1876 Longden, Major-General Henry Edward, C.B. 63, *Ennismore-gardens, S.W.; and United Service Club, S.W.*

1872 Longden, Sir J. R., K.C.M.G. *Government-house, Trinidad. Care of Mr. J. P. Martineau*, 13, *King's-road, Bedford-row, W.C.*

1865 *Longley, Lt.-Col. George, R.E. *Brookes's Club, St. James's-street, S.W.*

1847 Longman, Thos., Esq. *Paternoster-row, E.C.*

1858 Longman, William, Esq. 36, *Hyde-park-square, W.*

1870 *Longstaff, Lieut.-Colonel Llewellyn Wood. *Summergangs-hall, Hull.*

1861 Lonsdale, Arthur Pemberton, Esq.

1860 Looker, William Robert, Esq. *Melbourne, Australia. Care of Mr. Ashhurst*, 9, *Fenchurch-street, E.C.*

1875 1850 Lord, W. Barry, Esq. *Downshire-hill-cottage, Hampstead, N.W.*

1874 Lorne, The Most Hon. the Marquis of, K.T., M.P. 1, *Grosvenor-crescent, S.W.*

1876 Lort, William, Esq. *Yockleton-hall, near Shrewsbury.*

1875 *Lothian, Maurice Jno., Esq. *Woodcote-park, Blackshiels, N.B.*

1864 Lothian, William Schomberg, Marquis of. 15, *Bruton-street, W.*

1873 Lovell, Thomas, Esq., M.I.C.E.

Year of Election.

1873 Lovett, Major Beresford, R.E. *East India United Service Club, 14, St. James's-square, S.W.*

1856 Lovett, Phillips Cosby, Esq. *Liscombe-house, Liscombe, Leighton Buzzard.*

1867 Low, Alex. F., Esq. 84, *Westbourne-terrace, W.*

1875 Low, Chas. R., Esq. (Lieut. late I.N.) 16, *Glebe-place, Chelsea, S.W.*

1863 1860 Low, S. P., Esq. 55, *Parliament-street, S.W.*

1858 Lowden, Rev. George Rouse. *St. Leonard-villa, Hanwell, Middlesex.*

1859 Lowe, Captain W. Drury. *Myria, Bettws-y-Coed, Llanrwst, North Wales.*

1830 Lowry, Joseph Wilson, Esq. 39, *Robert-street, Hampstead-road, N.W.*

1873 *Lowther, Capt. Marcus, R.N. *Thornton, Ryde.*

1860 Loyd, Colonel W. K. *Union Club, S.W.*

1870 Luard, Captain Charles Edward, R.E. *Portsmouth.*

1873 Luard, Colonel R. G. A. *Eccles, near Manchester.*

1866 Luard, Wm. Charles, Esq. *Llandaff-house, Cardiff; and Athenæum Club, S.W.*

1871 *Lubbock, Sir John, Bart, M.P., F.R.S., &c. *High-elms, Beckenham, Kent.*

1876 1870*Lucas, Arthur, Esq., C.E. 19, *George-street, Hanover-square, W.*

1877 Luck, F. G., Esq. *The Olives, Wadhurst, Sussex.*

1875 Luckman, Alfred, Esq. 4, *Panton-street, Cambridge.*

1871 Ludlow, Edgar John David, Esq. *Care of Geo. Perry, Esq., 67, Charlewood-street, St. George's-road, S.W.*

1873 Lugard, General Right Hon. Sir Edward, G.C.B. *E 3, Albany, W.*

1872 *Lumsden, Colonel P. S., C.S.I., Quartermaster-General, Bengal Army. *United Service Club, Pall-mall, S.W.*

1860 Lumsden, Rev. R. C., M.A., F.R.A.S. *Maidenhead.*

1860 Lush, Sir Robert, Q.C. *Balmoral-house, Avenue-road, Regent's-park, N.W.*

1873 *Lushington-Tilson, Rev. W. R. Tilson Marsh, M.A. *Oxford and Cambridge Club, S.W.; Conservative Club, S.W.; and Stretham Manor, Isle of Ely.*

1876 *Luttrell, Lieut. Alexander Fownes (Gren. Gds.). *Guards' Club, Pall-mall, S.W.; and Dunster-castle, Somerset.*

1870 1880 Lyall, George, Esq. 43, *Queen's-gate-terrace, S.W.; and Hedley, near Epsom.*

1873 Lycett, Sir Francis, K.C.B. 18, *Highbury-grove, Highbury, N.*

1866 Lydall, J. H., Esq. 12, *Southampton-buildings, Chancery-lane, W.C.*

1873 Lydgate, Robert, Esq. *Upper School, Peckham, S.E.*

1873 Lydgate, Wm., Esq. *The Castle School, Guildford.*

1869 Lye, John Gaunt, Esq. 14, *Kensington-gate, Hyde-park-south, W.*

1877 Lyell, Francis H., Esq. 42, *Regent's-park-road, N.W.*

1861 *Lynch, Thomas Kerr, Esq. 31, *Cleveland-square, Hyde-park, W.*

1858 Lyne, Francis, Esq. 5, *Seagrave Place, Pittville, Cheltenham.*

1875 Lyne, Robt. E., Esq. *Royal Dublin Society, Dublin.*

1875 1890 Macaulay, James, Esq. 7, *Albemarle-street, W.*

1873 Macaulay, William, Esq. 122, *Leadenhall-street, E.C.*

1863 Macbraire, James, Esq. *Broadmeadows, Berwick-on-Tweed.*

Year of Election.	
1876	Macdona, G. de Laudre, Esq. *Hilbre-house, West Kirby, Cheshire.*
1875	*Macdonald, James, Esq. 17, *Russell-square, W.C.*
1874	Macdonald, Colonel John (Beng. Staff Corps). *Care of Messrs. Grindlay and Co.*, 55, *Parliament-street, S.W.*
1871	Macdonald, William, Esq. *Yokohama, Japan. Care of Messrs. Knevitt and Co.*, 3, *Sun-court, Cornhill, E.C.*
1843	Macdonnell, Sir Richard Graves, K.C.M.G., C.B. 66, *Onslow-gardens, S.W.; and Athenæum Club, Pall-mall.*
1873	MacEachen, Archibald, Esq. "*Seaside,*" *Campbeltown, Argyll, N.B.*
1865	Macfarlan, John G., Esq. *The Tower, Richmond-bridge.*
1876	1900Macfarlane, Donald, Esq., M.D. 11, *Southwick-place, Hyde-park, W.; and East India U. S. Club, St. James's-square, S.W.*
1874	Macfarlane, Donald H., Esq. 62, *Portland-place, W.*
1868	MacGregor, Lieut.-Col. C. M. 15, *Jermyn-street, S.W.*
1855	MacGregor, Duncan, Esq. *Athenæum Club, S.W.*
1872	*MacGregor, John, Esq., M.A. 7, *Vanbrugh-park East, Blackheath; and Athenæum Club, S.W.*
1845	*Macintyre, Patrick, Esq., F.S.A. (Off. Assoc. Inst. Act.). 1, *Maida-vale, W.*
1859	Mackay, Rev. Alexander, LL.D. 2, *Hatton-place, Grange, Edinburgh.*
1870	Mackay, Nevile F., Esq. 2, *Elm-court, Temple, E.C.*
1873	Mackelvie, Jas. Tannock, Esq. 21, *Victoria-st., S.W.; and* 7, *Albemarle-st., W.*
1877	Mackenzie, Capt. Colin (78th Highlanders). *Naval and Military Club, Piccadilly, W.*
1860	1910*Mackenzie, James T., Esq. *Hatchford, Cobham, Surrey.*
1873	Mackenzie, William, Esq., M.D., C.B. 3, *Talbot-square, Hyde-park, W.; and East India United Service Club, S.W.*
1864	*Mackeson, Edward, Esq. 13, *Hyde-park-square, W.*
1874	*Mackinlay, Andrew U., Esq. *Hazelhurst, Nutfield, Redhill.*
1862	Mackinlay, D., Esq. *Oriental Club, W.*
1867	Mackinlay, John, Esq., J.P., M.I.C.E., Chief Engineer and Inspector of Machinery, H.M. Dockyard, and Surveyor to the Port, Bombay. *Care of Charles Bannerman, Esq.*, 193, *Camberwell-new-road, Kennington, S.E.*
1864	Mackinnon, C. D., Esq. *Care of Messrs. J. Clinch and Sons*, 31, *Abchurch-lane, E.C.*
1855	*Mackinnon, Wm. Alex., Esq., M.P., F.R.S. 4, *Hyde-park-place, W.*
1865	*Mackinnon, W., Esq. *Balinakiel-by-Harbert, Argyleshire.*
1872	Mackintosh, Alex, Esq. 9, *Talbot-square, Hyde-Park, W.*
1861	1920Mackintosh, Alexander Brodie, Esq. *Oriental Club, W.; and Dunoon, Scotland.*
1860	Mackirdy, Lieut.-Gen. Elliot (69th Regiment). *U. S. Club, S.W.*
1873	Mackley, Thomas Cole, Esq. *Dunster-house, Mincing-lane, E.C.*
1871	Maclagan, Maj.-Gen. Robert, R.E. *Care of Messrs. Crawford, Colvin, and Co.*, 71, *Old Broad-street, E.C.*
1871	Maclaine, Murdoch G., Esq., of Lochvay. *Oban, Scotland.*
1860	Maclean, William Crighton, Esq., F.G.S. 31, *Camperdown-place, Great Yarmouth.*

Year of Election.	
1859	MacLeay, Sir George. *Pendell-court, Bletchingley.*
1870	MacLeod, Lieut. Angus, R.N. *Care of Messrs. Hallett and Co., 7, St. Martin's-place, W.C.*
1855	Maclure, Andrew, Esq. *Messrs. Maclure, Macdonald, and Macgregor, 97, Queen Victoria-street, E.C.*
1861	Maclure, John William, Esq. *The Home, Whalley-range, Manchester.*
1861	1930 Macmillan, Alex., Esq. 16, *Bedford-street, Covent-garden, W.C.*
1874	MacMurdo, Major-General, C.B. *Rose-bank, Fulham.*
1871	Macnab, Duncan Macpherson, Esq. *Union Club, S.W.*
1874	Macnamara, Surg.-Maj. F. N., M.D. (Indian Army). 28, *Palace-gardens-terr., W.*
1870	Macturk, John, Esq. 8, *Hillhead-gardens, Glasgow.*
1871	MacVicar, Lieut. Jno. A. (93rd Highlanders). *Naval and Military Club, 94, Piccadilly, W.*
1873	McAlpin, Donald A. L., Esq., R.N. *H.M.S. 'Favourite,' Queensferry, N.B.*
1873	McAlpin, Kenneth W. A. G., Esq. *Llanion-terrace, Pembroke-dock, South Wales.*
1875	McAndrew, Maj.-Gen. G. (Bengal Staff Corps). *Care of Messrs. Grindlay and Co., 55, Parliament-street, S.W.*
1863	McArthur, Alex., Esq., M.P. *Raleigh-hall, Brixton-rise, Brixton, S.W.*
1867	1940 McArthur, William, Esq. 1, *Guyder-houses, Brixton-rise, S.W.*
1872	McCall, John, Esq.
1876	McClean, Rev. D. Stuart. *Norwood-rectory, Southall, Middlesex.*
1868	M'Clean, Frank, Esq., M.A., C.E. *Ferncliffe, Tunbridge-wells.*
1860	McClintock, Admiral Sir Francis Leopold, F.R.S. *H.M. Dockyard, Portsmouth; and United Service Club, S.W.*
1871	*McClure, Joseph Henry, Esq. 9, *Rumford-place, Liverpool.*
1876	McConnell, Jas. Edw., Esq., C.E. 2, *Dean's-yard, Westminster, S.W.*
1861	*McConnell, W. R., Esq., Barrister-at-Law. 12, *King's-Bench-walk, Temple, E.C.; and Charleville, Belfast.*
1862	McCosh, John, Esq., M.D. *Junior United Service Club, S.W.*
1865	McDonald, James, Esq. *Oriental Club, Hanover-square, W.*
1865	1950 McEuen, D. P., Esq. 24, *Pembridge-square, Bayswater, W.*
1874	McGavin, Alan Lawrie, Esq. *Gordon-lodge, Wanstead; and 2, Barge-yard, Victoria-street, S.W.*
1867	McGregor, Duncan, Esq. *Clyde-place, Glasgow.*
1869	McGrigor, Alexander Bennett, Esq. 19, *Woodside-terrace, Glasgow.*
1874	McIlwraith, Robert, Esq. 36, *Prince's-gate, S.W.*
1866	*McIvor, W. G., Esq., *Sup. of Chinchona Plantations, Ootacamund, Madras. Care of Mr. E. Bumpus, Holborn-bars, E.C.*
1873	McKerlie, P. H., Esq., F.S.A., Scot., &c. 26, *Pembridge-villas, Bayswater, W.*
1867	*McLean, Hon. John. *Oamaru, New Zealand. Care of Messrs. Redfern, Alexander, and Co., 3, Great Winchester-street-buildings, E.C.*
1876	*McLean, Robert Allan, Esq., F.S.S. *Duart-house, The Avenue, Eltham-road, Lee, S.E.*
1870	McLeod, Major-Gen. W. C. 62, *Gloucester-gardens, Hyde-park, W.; and 14, St. James's-square, S.W.*

Year of Election	
1874	1960 McMahon, Colonel A. *Care of Messrs. H. S. King and Co., Cornhill, E.C.*
1875	McMaster, James, Esq. 1, *Stanhope-gardens, Queen's-gate, S.W.*
1876	McMurdo-Wright, Bryce, Esq. 54, *Guilford-street, Russell-square, W.C.*
1866	McNair, Major John F. A., R.A. *Care of Messrs. Codd and Co.,* 35, *Craven-street, W.C.*
1839	M'Neil, The Right Hon. Sir John, G.C.B. *Granton, near Edinburgh.*
1876	McNeill, Colonel J. C., V.C., C.B. *United Service Club, Pall-mall.*
1873	*McVean, Colin A., Esq., *Care of Rev. D. McVean, Bunessan, Scotland.*
1875	Madan, Rev. J. R., *Cedar-villa, Kensington, W.*
1872	Magrath, Colonel John R., Madras Artillery, Ret. *Murhill, near Bradford-on-Avon, Wilts; and East India U. S. Club,* 14, *St. James's-square, S.W.*
1877	Mair, G. J. J., Esq., F.S.A. 41, *Upper Bedford-place, Russell-square, W.C.*
1874	1970 Maitland, Rev. A. Gray. *Roseneath, Sydenham-park, S.E.*
1845	*Major, Richard Henry, Esq., F.S.A. *Athenæum Club, S.W.; and British Museum, W.C.*
1868	*Makins, Henry F., Esq. 8, *Palace-gate, Kensington, W.; and Reform Club, S.W.*
1858	Malby, John Walter, Esq. 15, *Richmond-villas, Seven-sisters'-road, Holloway, N.*
1853	*Malby, Thomas, Esq. 2, *Park-villas, Seven-sisters'-road, Holloway, N.*
1862	*Malcolm, Major Edward Donald, R.E. *Edinburgh.*
1863	Malcolm, James, Esq. 22, *Prince's-gate, Knightsbridge, S.W.*
1843	*Malcolm, W. E., Esq. *Burnfoot, Langholme, near Carlisle.*
1876	Malden, B. Jno., Esq. 14, *Great Coram-street, Russell-square.*
1872	Malleson, Colonel G. B. *Care of Coutts and Co., Strand, W.C.*
1853	1980 *Mallet, Chas., Esq. *Audit-office, W.C.; and* 7, *Queensbro'-terr., Bayswater, W.*
1876	Maltby, F. Cecil, Esq. *Thatched-House Club, St. James's-street.*
1877	Man, Col. Henry (Madras Staff Corps). *Westbrooke, Godalming.*
1876	Man, Captain J. Alexander. *Care of P. J. King, Esq.,* 10, *St. Stephen's-square, Bayswater, W.; and Junior United Service Club.*
1872	Man, Captain William. *Care of B. F. Stevens,* 4, *Trafalgar-square, W.C.*
1872	Man, William, Esq. *Woodford, Essex.*
1875	Manchester, Wm. D. Montagu, Duke of. 1, *Great Stanhope-street, W.; and Kimbolton Castle, St. Neots.*
1874	Mann, H., Esq. *Belgrave-mansions, S.W.; and* 13, *Upper Brunswick-place, Brighton.*
1860	Mann, James Alexander, Esq., M.R.A.S.
1866	Mann, Robert James, Esq., M.D. 5, *Kingsdown-villas, Wandsworth-common, S.W.*
1866	1990 Manners, George, Esq., F.S.A. *Lansdowne-road, Croydon.*
1868	Manners-Sutton, Hon. Graham. 50, *Thurloe-square, S.W.*
1874	Manners-Sutton, Hon. Robert Henry. 12, *Queensberry-pl., S. Kensington, S.W.*
1856	Manning, Frederick, Esq. *Byron-lodge, Leamington; and* 8, *Dover-street, W.*
1864	*Mansell, Captain A. L. *Hydrographic-office, Admiralty, S.W.*

Year of Election.	
1869	Mantell, Sir John Iles. *County Police-office, Strangeways, Manchester.*
1859	Mantell, Walter Baldock Durant, Esq. *Wellington, New Zealand. Care of J. G. Cooke, Esq., 25, Austin Friars, E.C*
1873	*Mantle, Wm. John, Esq. *Northgate, Lincoln.*
1876	Mappin, Joseph Chas., Esq. 35, *Dulwich-road, S.E.*
1869	March, Edward Bernard, Esq., H.M. Consul, Callao. *Care of Messrs. F. O'Brien and Co., 43, Parliament-street, S.W.*
1871	2000 Margetts, William G., Esq. *Allamira, Stonebridge, Willesden, N.W.*
1872	Margöschis, John Thomas, Esq. *Care of Mrs. Margöschis, Brodie-villa, Leamington.*
1874	Marjoribanks, Edw., Esq. 134, *Piccadilly, W.*
1873	Markham, Captain Albert Hastings, R.N. 21, *Eccleston-square, S.W.*
1854	Markham, Clements Robert, Esq., C.B., F.R.S. *India-office, S.W.; 21, Eccleston-square, S.W.; and Athenæum Club, S.W.*
1877	Marsh, Capt. H. C. *Care of Messrs. Hoare and Co., 37, Fleet-street, E.C.*
1857	Marsh, Matthew Henry, Esq. *Oxford and Cambridge Club, S.W.*
1876	Marshall, Horace Brooks, Esq. *Clifton-villa, Brixton.*
1862	*Marshall, J. G. Dou, Esq. *Birkenshaw, Hawley, Farnboro'-station, Hants.*
1873	Marshall, John, Esq. *Auckland-lodge, Queen's-road, Richmond.*
1862	2010 Marshall, William, Esq. 71, *Mornington-road, W.*
1876	*Marshall, William, Esq. 37, *Norfolk-street, Strand, W.C.*
1859	*Marsham, The Hon. Robert. 5, *Chesterfield-street, Mayfair, W.*
1857	Marshman, J. C., Esq. 7, *Kensington-palace-gardens, W.*
1875	Marston, Edward, Esq. 188, *Fleet-street, E.C.*
1877	Marten, Chas. Henry, Esq. *Combe-lodge, Blackheath, S.E.*
1874	Marten, C. Rous, Esq. *Wellington, New Zealand.*
1871	Marten, Elliott, Esq., Vice-Consul, Sarawak. *Care of W. T. Marten, Esq., 30, Great St. Helen's, E.C.*
1875	Martin, Fras. Offley, Esq. *Rose-hill, Hampton.*
1861	Martin, Henry, Esq. *Sussex-house, Highbury-new-park, N.*
1860	2020 *Martin, Richard Biddulph, Esq. *Clarewood, Bickley.*
1862	Martin, Thomas, Esq. 5, *Compton-terrace, N.*
1870	Martin, Wm. Coleman, Esq.
1876	Marzetti, A. C., Esq. *Bostol-house, Abbey-wood, Kent.*
1871	Mason, Charles, A. J., Esq. 3, *Gloucester-crescent, Hyde-park, W.*
1875	Mason, Dr. Samuel. 44, *Finsbury-circus, E.C.*
1871	Master, Chas. Hoskins, Esq. *Barrow-green-house, Oxted, near Godstone, Surrey.*
1870	Masterman, Edward, Esq. 30, *Threadneedle-street, E.C.; and 27, Clement's-lane, Lombard-street, E.C.*
1870	Masterman, Edward, jun., Esq. 57½, *Old Broad-st., E.C.; and Walthamstow.*
1876	Masterman, T. W., Esq. 4, *Spencer's-hill, Wimbledon.*
1869	2030 *Matheson, Alexander, Esq., M.P. 33, *South-street, Park-lane, W.; and Ardross-castle, Ross-shire, N.B.*

Year of Election.

1874 *Matheson, Hugh Mackay, Esq. 3, *Lombard-street, E.C.*

1845 *Matheson, Sir James, Bart., F.R.S. 13, *Cleveland-row, S.W.; and Achany, Bonar-bridge, Sutherlandshire, &c.*

1871 Mathew, George Buckley, Esq. *Care of Messrs. Boddington and Co., St. Helen's-place, E.C.*

1874 Mathews, Chas. Edward, Esq. *Oakgate, Augustus-road, Edgbaston, Birmingham; and Arts Club, W.*

1872 Mathews, William, Esq., M.A. 49, *Harborne-road, Birmingham.*

1858 Mathieson, James Ewing, Esq. 77, *Lombard-street, E.C.; and West-heath-lodge, Hampstead, N.W.*

1873 Maude, Colonel G. A. *Royal Mews, Pimlico, S.W.*

1875 Maudslay, Athol, Esq. 45, *Sloane-street, S.W.*

1875 Maule, Geo. Norman, Esq. 1, *Hare-court, Temple, E.C.; and University Club, S.W.*

1871 2040 Mawbey, Henry, Esq. 260, *Amhurst-road, Stoke Newington, N.*

1872 Maxwell, John, Esq. *Lichfield-house, Richmond.*

1860 *Maxwell, Sir William Stirling, Bart., M.P. 10, *Upper Grosvenor-street, W.; and Keir, Dunblane, N.B.*

1855 May, Staff-Commr. Daniel John, R.N. *Care of Messrs. Case and Loudensack, 1, James-street, Adelphi, W.C.*

1876 May, Wm., Esq. *St. Mary Cray, Kent.*

1858 Mayer, Joseph, Esq., F.S.A. 68, *Lord-street, Liverpool.*

1861 Mayers, William S. F., Esq., Chinese Secretary, H.B.M. Legation, Peking. *Care of James West, Esq., 79, Gracechurch-street, E.C.*

1875 Maynard, R. Russell, Esq. *Copthorne, Hornsey-lane, N.*

1862 Mayne, Captain Richard Charles, R.N., C.B. 101, *Queen's-gate, S.W.*

1858 Mayo, Captain John Pole. *Army and Navy Club, S.W.*

1867 2050 Mayson, John S., Esq., J.P. 5, *St. James's-square, Manchester.*

1863 Meade, The Hon. Robert Henry. *Colonial-office, S.W.; and 3, Belgrave-square, S.W.*

1874 Meadows, Dr. Alfred. 27, *George-street, Hanover-square, W.*

1875 Meakin, Edw. E., Esq. *Rosenfels, Red-hill, Surrey; and 22, Fenchurch-st., E.C.*

1872 Measom, George Samuel, Esq. *St. Margaret's, Isleworth.*

1871 Medhurst, Sir Walter H., Knt. *Athenæum Club.*

1862 *Medlycott, Commander Mervyn B., R.N. *Care of Messrs. Woodhead and Co., Charing-cross, S.W.*

1876 *Meiggs, John G., Esq. 7, *Craven-hill, Bayswater, W.*

1874 *Meinertzhagen, Daniel, Esq. 10, *Rutland-gate, S.W.*

1854 Melvill, Major-General Sir Peter Melvill. 27, *Palmeira-square, Brighton.*

1838 2060 Melvill, Philip, Esq., F.R.A.S. *Ethy-house, Lostwithiel, Cornwall.*

1877 Mendel, Samuel, Esq. *Chislehurst, Kent.*

1875 Menzies, Jas. Irvine, Esq. 76, *Stamford-street, S.E.*

1871 Mercer, Henry C., Esq., B.A. *Denham-lodge, Uxbridge.*

1875 Mercer, Thomas, Esq. *Uxbridge.*

Year of Election.	
1868	*Merewether, Colonel Sir William Lockyer, K.C.S.I., C.B. *Kurrachee. Care of Messrs. King and Co., 65, Cornhill, E.C.*
1871	*Merritt, Douglas, Esq. *Lyndhurst, Irvington-on-Hudson, New York, U.S. Care of J. S. Morgan and Co., 22, Old Broad-street, E.C.*
1866	Messiter, Charles A., Esq. *The Avenue, Brampford Speke, near Exeter.*
1871	Messum, Josiah Young, Esq., R.N., F.R.A.S., Controller of H.M.'s Packet Services. *General Post-office, E.C.; and Bedford-villa, Sydenham-road, Croydon.*
1867	Metcalfe, Frederic Morehouse, Esq. *Wisbech, Cambridgeshire.*
1874	2070 Methuen, Capt. Hon. Paul (Scots Fusil. Gds.) *Guards' Club, Pall-mall, S.W.*
1871	Methven, Captain Robert. 44, *Chester-square, S.W.*
1837	*Mexborough, John Chas. Geo., Earl of. 33, *Dover-street, W.; and Methley-park, near Leeds.*
1865	*Michell, General J. E., R.H.A.
1863	*Michie, A., Esq. 55, *Leadenhall-street, E.C.*
1873	Michie, Honourable Archibald, Q.C. 8, *Victoria-chambers, Victoria-street, S.W.; and Reform Club, S.W.*
1848	Middleton, Rear-Admiral Sir G. N. Broke, Bart. *Shrubland-park, Needham, Suffolk; and 35, Albemarle-street, W.*
1875	Middleton, Jno. Edmund, Esq. 61, *Clapham-park-road, S.W.*
1870	*Midwinter, William Colpoys, Esq. *Akyab, British Burmah.*
1868	*Miers, John William, Esq., C.E. 74, *Addison-road, Kensington, W.*
1859	2080 Miland, John, Esq. *Clairville, Lansdown-road, Wimbledon.*
1866	Mildmay, Capt. Herbert St. John (Rifle Brigade). 19, *Charles-street, Berkeley-square, W.*
1872	Miles, Captain Samuel Barrett (Bombay Staff Corps), Political Agent in Mekran. *Care of Messrs. Trübner and Co., Ludgate-hill, E.C.*
1876	Miller, Chas. A. D., Esq. *Sherbrooke-lodge, Brixton, S.W.*
1874	Miller, Capt. David, R.N. *United Service Club, Pall-mall, S.W.*
1861	*Miller, Captain Henry Matthew, R.N. *United Service Club, S.W., and Fern-side, Sevenoaks.*
1868	Miller, Robert Montgomerie, Esq. *Culverden-grove, Tunbridge-wells.*
1853	*Miller, Admiral Thomas. *United Service Club, S.W.*
1861	Milligan, Joseph, Esq. 6, *Craven-street, Strand, W.C.*
1857	Mills, Arthur, Esq. 34, *Hyde-park-gardens, W.*
1863	2090 *Mills, John R., Esq. *Kingswood-lodge, Tunbridge-wells.*
1866	Milne, Admiral Sir Alex., Bart., G.C.B. 1, *Lowndes-street, S.W.; and Inveresk, Musselburgh.*
1867	Milner, Rev. John, B.A. *The Rectory, Middleton-in-Teesdale, Darlington.*
1862	*Mitchell, George, Esq. 22, *Bolton-street, Piccadilly, W.*
1859	Mitchell, Sir William. *Strode, Ivybridge, Devon.*
1872	Mitchell, William Aug., Esq. *Marlboro'-villa, Lea-bridge-road, E.*
1874	Mitford, Col. Jno. Philip Osbaldiston. *Mitford-hall, Morpeth, Northumberland; and Army and Navy Club, S.W.*
1851	*Mocatta, Frederick D., Esq. 9, *Connaught-place, W.*

Year of Election.	
1873	*Moffat, Rev. Dr. Robert. 64, *Knowle-road, Brixton-road, S.W.*
1853	Moffatt, George, Esq. 103, *Eaton-square, S.W.*
1868	2100 Moffitt, John, Esq. *General Register Office of Seamen, 6, Adelaide-place, London-bridge, E.C.*
1873	Moleyns, Major T. A. de, R.A. 53, *Seymour-street, Portman-square, W.*
1861	Mollison, Alexander Fullerton, Esq.
1876	Molyneux, Lieut. W. C. F. *South Camp, Aldershot; and Junior United Service Club, S.W.*
1870	Moneta, Don Pompeio (Chief Engineer, Argent. Repub.). *Buenos Ayres.*
1877	Money, Major Gerard Noel (Bengal Staff Corps). *Stodham-park, Petersfield; and care of Messrs. H. S. King, 45, Pall-mall, S.W.*
1871	Montagu, Jno. M. P., Esq. *Downe-hall, Bridport, Dorset, and Union Club, S.W.*
1862	*Montague, Major Horace. 11, *Clifton-villas, Maida-hill, W.*
1830	*Montefiore, Sir Moses, Bart., F.R.S., F.R.S.N.A. 7, *Grosvenor-gate, Park-lane, W.; and East-cliff-lodge, Ramsgate.*
1859	Montgomerie, Lieut.-Colonel T. G., Royal Engineers, F.R.S., Dep. Sup. Trig. Survey. *Care of Messrs. Alexander Fletcher and Co., 10, King's-arms-yard, Moorgate-street, E.C.; and Athenæum Club, Pall-mall, S.W.*
1876	2110 Montgomery, Jno. B. H., Esq. 33, *Mount-street, Grosvenor-square, W.*
1860	Montgomery, Robert Mortimer, Esq.
1865	Montgomery, Sir Robert, K.C.B., G.C.S.I. 7, *Cornwall-gardens, Queen's-gate, S.W.*
1874	Moodie, G. P. Esq. *Care of J. J. Pratt, Esq., 24, Coleman-street, E.C.*
1839	Moody, General R. C., R.E. *Caynham-house, near Ludlow, Shropshire.*
1857	*Moor, Rev. Allen P., M.A., F.R.A.S. *St. Clement's-vicarage, Truro.*
1874	Moore, Adolphus W., Esq. *India-office, S.W.*
1861	Moore, John Carrick, Esq., F.R.S. *Corswall, Wigtonshire; and 113, Eaton-square, S.W.*
1870	Moore, John, Esq. 36, *Mark-lane, E.C.*
1870	*Moore, Joseph, Esq. *Rydal-mount, Champion-hill.*
1870	2120 Moran, Benjamin, Esq. 20, *Norfolk-terrace, Bayswater, W.; and 5, Westminster-chambers, Victoria-street, S.W.*
1872	*Morant, Capt. J. L., L. R. Mad. Eng. *Mountstuart, Ootacamund, Neilgherries, Madras Presidency. Care of Messrs. John Gladding and Sons, 13, Paternoster-row, E.C.*
1863	More, R. Jasper, Esq. *Linley-hall, Salop.*
1869	*Morgan, Delmar, Esq. 15, *Roland-gardens, South Kensington, S.W.*
1864	Morgan, D. L., Esq. (Deputy Inspector-General, R.N.). *Melville Hospital, Chatham.*
1861	Morgan, Junius Spencer, Esq. 13, *Prince's-gate, Hyde-park, S.W.*
1866	Morland, Lieut. Henry, late I.N. *Assistant Dockmaster, &c., Bombay.*
1877	Morris, Edward S., Esq. *Wanderers' Club, Pall-mall, S.W.; and Pontamman, Cross Inn, Carmarthenshire.*
1839	*Morris, Charles, Esq. *University Club, S.W.*
1871	Morris, Edwd. Ellis, Esq. *Care of H. Morris, Esq., Eastcote-house, St. John's-park, Blackheath.*

Year of Election.		
1874	2130	Morris, Rev. R. Leslie, M.A. *Fitzroy-lodge, Highgate.*
1871		*Morrison, Alf., Esq. 16, *Carlton-house-terrace, S.W.*
1863		Morrison, Colonel J. C. D. *Hillfoot-house, Dollar, Scotland.*
1867		Morrison, Pearson, Esq. *Care of Messrs. Roberts and Dickson, Chester.*
1865		Morson, Thomas, Esq. 124, *Southampton-row, Russell-square, W.C.*
1876		Mortimore, Foster, Esq. 78, *Eccleston-square, S.W.*
1873		Mosenthal, Adolph, Esq. 18, *Aberdeen-park, Highbury, N.*
1869		Moser, Robert James, Esq. 45, *Bedford-square, W.C.*
1869		Mott, F. T., Esq. 1, *De Montfort-street, Leicester.*
1861		*Mount, Frederick J., Esq., M.D., Surgeon-Major and Inspector-General of Prisons, Bengal Army, &c. 12, *Durham-villas, Kensington, W.; and Athenæum Club, S.W.*
1868	2140	*Mounsey, Aug. Henry, Esq. *British Embassy, Vienna. Care of R. H. Mounsey, Esq., Castle-street, Carlisle.*
1871		*Mowatt, James, Esq., M.A. 51, *Notting-hill-square, W.; and Caius College, Cambridge.*
1871		*Mozley, H. W., Esq., M.A. *Eton College.*
1858		Mudie, Charles Edward, Esq. *Muswell-hill.*
1858		Mueller, Ferdinand, Esq., M.D., PH.DR. *Director of the Botanical Gardens, Melbourne. Care of Messrs. Dulau and Co.,* 37, *Soho-square, W.*
1874		*Muir, Hugh B., Esq. 26, *Old Broad-street, E.C.*
1867		*Muir, Thomas, Esq. *Madeira; and* 24, *York-terrace, Regent's-park, N.W.*
1869		Müller, Albert, Esq. *Eaton-cottage, South Norwood, S.E.*
1876		Mulliner, Robt. Boulverie, Esq. *Grove-house, Grove-park, Chiswick.*
1875		Mundy, Daniel Louis, Esq. *Care of Messrs. Budden, Fissher, and Co.,* 48, *Fenchurch-street, E.C.*
1875	2150	Munro, Dr. 11, *Park-lane, W.*
1873		Münster, His Excellency, Count. (Ambassador of the German Empire.) *German Embassy,* 9, *Carlton-house-terrace, S.W.*
1869		Munton, Francis Kerridge, Esq. *Gloucester-house, Stonebridge-park, Willesden, N.W.*
1866		*Murchison, John H., Esq. *Junior Carlton Club, S.W.*
1859		Murchison, Kenneth R., Esq. 24, *Chapel-street, Park-lane, W.; and Junior United Service Club.*
1830		*Murdoch, Sir Thomas W. Clinton, K.C.M.G. 8, *Park-street, Westminster, S.W.; and* 88, *St. George's-square, S.W.*
1860		Murray, George J., Esq. *Wootton-court, Canterbury; and Junior Carlton Club, S.W.*
1872		*Murray, G. S. D., Esq. 118, *Pall-mall, S.W.*
1868		*Murray, Henry, Esq. *Garrick Club, Garrick-street, W.C.*
1844		*Murray, James, Esq.
1830	2160	Murray, John, Esq. 50, *Albemarle-street, W.; and Newstead, Wimbledon, S.W.*
1872		*Murray, John, jun., Esq. 50, *Albemarle-st., W.; and Newstead, Wimbledon, S.W.*
1876		Murray, Lieut. John Geo., R.A. *Lisnamaudre, Crossdoney, Ireland.*

Year of Election.	
1870	Murray, T. Douglas, Esq. 34, *Portland-place, W.*
1860	*Murray, Major W. G., late Assistant Surveyor-General, Calcutta. *Lairthwaite, Keswick, Cumberland; and Portigliolo, Ajaccio, Corsica.*
1870	Murray, William Vaughan, Esq., M.R.I., &c. 4, *Westbourne-crescent, Hyde-park, W.*
1865	Mussy, H. G. de, Esq., M.D.
1876	Nagaoka, M. J., Esq. (Justice). 3, *Adelphi-terrace, Strand.*
1876	Nahishima, N. H., Esq. 41, *Clanricarde-gardens, Bayswater, W.*
1875	Naidu, P. Venkatakrishnama, Esq., Barrister-at-Law, High Court, Madras. *Care of Messrs. Binny and Co., Leadenhall-street.*
1865	2170 Nairne, P. A., Esq. 2, *Grove-hill, Camberwell, S.E.*
1868	Napier, of Magdala, Lord, G.C.B., G.C.S.I., F.R.S. *Care of Messrs. Coutts and Co., Strand.*
1876	Napier, Capt. Hon. Geo. *Care of Messrs. Grindlay and Co.*, 55, *Parliament-street, S.W.*
1861	Napier, William, Esq.
1870	Napier, William J. Geo. (Master of Napier.) 1, *Queen-square, Westminster, S.W.; and Thirlestone-castle, Selkirkshire.*
1871	Nares, Captain Sir George S., R.N., K.C.B. *Care of the Hydrographer, Admiralty, S.W.*
1859	*Nasmyth, Capt. David J. 5, *Charlotte-street, Edinburgh.*
1875	Neal, Capt. William. *Army and Navy Club, Pall-mall.*
1875	Needham, S. H., Esq. 5, *Mecklenburg-street, Mecklenburg-square, W.C.*
1873	Nelson, George Henry, Esq. 1, *Hillside, Wimbledon. S.W.*
1857	2180 *Nesbitt, Henry, Esq. 12, *Victoria-villas, Kilburn, N.W.*
1875	Nesbitt, William, Esq. *Junior Carlton Club, Pall-mall, S.W.*
1869	Neville, Lieut.-Col. Edward. 6, *Bolton-gardens, South Kensington, S.W.*
1870	Newall, Wm. Johnstone, Esq. 33, *South-street, Park-lane, W.*
1876	Newbatt, Benjamin, Esq., F.S.S., &c. 7, *Vicarage-gardens, Campden-hill, W.*
1876	Newby, Edwin H., Esq. *Chatham-buildings, New-bridge-street, E.C.*
1867	Newdigate, Lieut.-Col. Francis W. (Coldstream Guards) 26, *Seymour-street, W.; and Byrkley-lodge, Needwood Forest, Burton-upon-Trent.*
1876	Newman, Geo. G., Esq. 75 and 76, *Cornhill, E.C.*
1856	Newman, Thomas Holdsworth, Esq. 9, *Gt. Cumberland-place, Hyde-park, W.*
1873	Newton, Alfred P., Esq. 15, *Sheffield-gardens, Campden-hill, W.*
1872	2190 Newton, Wm., Esq. 11, *Mitre-court, Temple, E.C.*
1870	Nicholas, W., Esq. 2, *Shirley-villas, Prospect-hill, Walthamstow.*
1870	Nicholl, Henry John, Esq. 16, *Hyde-park-gate, W.*
1870	Nichols, James, Esq. 22, *Laurence Pountney-lane, E.C.; and The Mount, Kenley, Surrey.*
1865	*Nichols, Robert C., Esq. 5, *Sussex-place, W.*

Year of Election.	
1856	Nicholson, Sir Charles, Bart., D.C.L. *The Grange, Totteridge, Herts, N.*
1875	Nicholson, Robert, Esq. *Loan End-house, Norham, near Berwick-on-Tweed, Northumberland.*
1868	Nicol, Geo. Wm., Esq. 312, *South Lambeth-road, S.W.*
1869	*Nicol, Robert, Esq. *Reform Club, S.W.; and Westminster-palace-hotel, S.W.*
1868	Nicol, Wm., Esq. 10, *Ashley-street, Victoria-street, S.W.; and Fawsyde, Kenneff, Kincardine.*
1871	2200 Nicols, Arthur Robert, Esq. 11, *Church-row, Hampstead, N.W.*
1836	Nicolson, Vice-Admiral Sir Frederick Wm. Erskine, Bart., C.B. 15, *William-street, Lowndes-square, S.W.*
1873	Nimmo, Rev. R., B.A., R.N. *Mill-house, Grantchester, near Cambridge; and H.M.S. 'Lord Warden.'*
1864	Nissen, H. A., Esq. *Mark-lane, E.C.*
1858	Nix, John H., Esq. 77, *Lombard-street, E.C.*
1874	*Noldwritt, Jno. Spencer, Esq. 352, *Albany-road, Camberwell, S.E.*
1857	*Nolloth, Admiral Matthew S. A 12, *Albany, Piccadilly, W.; and United Service Club, S.W.*
1876	Norman, Capt. Charles B. *Care of Delhi and London Bank, 76, King William-street, E.C.*
1865	Norman, H. J., Esq. 4, *Halkin-street, Grosvenor-place, S.W.*
1876	Normandy, Frank, Esq. 6, *Church-meadows, West-hill, Sydenham, S.E.; and 3, Garden-court, Temple, E.C.*
1872	2210 Norris, Charles, Esq. 124, *Wood-street, E.C.; and Marischal-road, Lee, Kent.*
1860	Norris, Harry, Esq. *Colonial-office, S.W.; and 4, Little St. James's-street, S.W.*
1861	North, Alfred, Esq. 23, *Lansdowne-crescent, Notting-hill, W.*
1865	Northumberland, Algernon George, Duke of. 2, *Grosvenor-place, S.W.*
1875	Norton, Geo., Esq., M.A. 2, *Gloucester-place, Hyde-park, W.*
1862	Notman, Henry Wilkes, Esq. 7, *Great Marlborough-street, W.*
1862	Nourse, Henry, Esq. *Conservative Club, S.W.*
1858	*Oakeley, R. Banner, Esq.
1875	Oates, Wm. Edward, Esq. *Meanwoodside, near Leeds.*
1858	Ogilvie, Edward D., Esq. *Yulgillar, Clarence-river, New South Wales. Care of Messrs. Marryat and Sons, Laurence Pountney-lane, E.C.*
1875	2220 Ogilvie, Geo. M., Esq. 14, *St. James's-square, S.W.; and Raleigh Club, Regent-street, S.W.*
1863	Ogilvy, Col. Thos. 23, *Grafton-st., Piccadilly, W.; and Ruthven, Forfarshire, N.B.*
1877	O'Halloran, Joseph Sylvester, Esq. 1, *Whitehall-gardens, S.W.*
1876	*O'Keeffe, Commr. Yelverton, R.N. 14, *Avington-grove, Penge, S.E.*
1873	Older, W. Aug., Esq. *Carrington-lodge, Richmond.*
1861	Oldershaw, Capt. Robert Piggott. 74, *Warwick-square, Belgrave-road, S.W.*
1874	Oldham, Surgeon-Major C. F. *Care of Rev. J. L. Morris, Fillongley, Coventry.*

Year of Election.

1870 Oldham, Henry, Esq., M.D. 4, *Cavendish-place, W.*

1855 Oliphant, Laurence, Esq. *Athenæum Club, S.W.*

1866 Oliver, Major S. P., 12th Brigade R.A. *Care of Rev. W. Oliver, Bovinger-rectory, Ongar, Essex.*

1845 2230 *Ommanney, Admiral Erasmus, C.B., F.R.S., F.R.A.S. 6, *Talbot-square, Hyde-park, W.; and United Service Club, S.W.*

1838 *Ommanney, H. M., Esq. *Blackheath, S.E.*

1867 Ormathwaite, John Benn-Walsh, Lord. 28, *Berkeley-square, W.*

1873 *Ormerod, Henry Mere, Esq. *Broughton-park, Manchester.*

1873 Orpen, F. H. S., Esq. *Barkly, Griqualand West, South Africa.*

1875 Orred, Chas. F. d'Angers, Esq. 34, *Rutland-gate, S.W.*

1853 Osborn, Sir George R., Bart. *Travellers' Club, S.W.; and Chicksand-priory, Beds.*

1861 *Osborne, Lieut.-Col. Willoughby. *Political Agent, Bhopal, Schira, India.*

1875 Osbourne, Jno. Smyth, Esq., jun. *Heath-house, Stapleton, Bristol.*

1852 Oswell, William Cotton, Esq. *Groombridge, Kent.*

1875 2240 Overall, Wm. Henry, Esq., F.S.A. *Guildhall, E.C.*

1870 *Overbeck, M. le Chev. G. de. *Hong-Kong. Care of Messrs. King and Co., 65, Cornhill, E.C.*

1875 Overbury, E. N., Esq. (Madras Civil Service). 14, *St. James's-square, S.W.*

1844 *Overstone, Samuel, Lord, M.A., M.R.I. 2, *Carlton-gardens, S.W.; and Wickham-park, Surrey.*

1873 Oxenham, Edward Lavington, Esq. *Nutcombe-house, Weybridge, Surrey.*

1875 Oxley, Fredk., Esq. 23, *Gloucester-crescent, Hyde-park, W.*

1868 Owden, Thomas S., Esq. *Mount-pleasant, Philip-lane, Tottenham.*

1874 Packe, William, Esq. 1, *Cavendish-square, W.*

1873 Page, George Gordon, Esq., C.E. 4, *Great James-street, Gray's-inn, W.C.*

1877 Page, Wm. Irving, Esq. *Wimbledon-common, S.W.*

1876 2250 *Pallett, Robt. Hy. Chas., Esq. *Theydon-hall, Theydon Bois, Essex.*

1870 Palmer, F. J., Esq., R.N. 8, *Cullum-street, E.C.*

1865 *Palmer, Captain George, R.N. *Eskbank-lodge, Bolton-road, Eastbourne.*

1870 *Palmer, John Linton, Esq., Surg. R.N. 24, *Rock-park, Rockferry, Cheshire.*

1872 Palmer, Joseph, Esq., B.A., &c. *Wells, Somerset.*

1873 Palmer, J. Horsley, Esq. 56, *Cromwell-road, Queen's-gate, S.W.*

1838 *Palmer, Samuel, Esq.

1869 *Palmer, T. G. A., Esq. 5, *Paper-buildings, Inner Temple, E.C.*

1870 Pannel, Charles S., Esq. *Walton-lodge, Torquay.*

1865 *Papengouth, Oswald C., Esq., C.E. *Care of W. Hornibrook, Esq., 6, Regent's-square, W.C.*

1863 2260 *Paris, H.R.H. le Comte de.

1864 Parish, Captain A. 1, *Wellington-place, Guildford.*

Year of Election.

1876 *Parish, Chas. Woodbine, Esq. *Care of Messrs. Egerton, Hubbard and Co., St. Petersburg.*

1849 *Parish, Capt. John E., R.N. *Army and Navy Club, S.W. Care of Messrs. Stilwell, Arundel-street, Strand.*

1833 *Parish, Sir Woodbine, K.C.H., F.R.S., &c. *Quarry-house, St. Leonards-on-Sea.*

1874 Park, Abraham, Esq. *Warrington-terrace, Ashton-under-Lyne; and Morningdale-house, Renfrewshire, N.B.*

1873 Park, James Dickson, Esq. 48, *Queen's-gate-gardens, South Kensington, S.W.*

1866 Parker, Capt. Francis G. S. (54th Regiment), F.G.S., A.I.C.E. *Morar, Gwalior.*

1875 *Parker, Honourable Francis. 94, *Eaton-square, S.W.; and* 9, *King's-Bench-walk, Temple, E.C.*

1873 Parker, James, Esq. 45, *Leinster-square, Hyde-park, W.*

1850 2270 Parkes, Sir Harry S., K.C.B., H.M. Minister Plenipotentiary, &c., in Japan.

1873 Parkin, George Lewis, Esq. 22, *Park-lane, W.*

1877 Parkin, Thomas, Esq., M.A. 3, *Rue Monsigny, Paris. Care of Rev. John Parkin, Halton-vicarage, Hastings.*

1850 *Parkyns, Mansfield, Esq., F.Z.S. *Arthur's Club, St. James's-street, S.W.; and* 59, *Prince's-square, Bayswater, W.*

1876 Parlane, Jas., Esq. *Appleby-lodge, Rusholme, Manchester.*

1877 Parr, Commander Alfred A. Chase, R.N. *Powys-lodge, Bickley, Kent.*

1872 Parry, Edward, Esq. 290, *Camden-road, N.W.*

1872 *Parry, Francis, Esq. *Stoney Stretton-hall, Yockleton, near Shrewsbury.*

1873 Pasco, Captain Crawford, R.N. *Care of Messrs. Case and Loudensack,* 1, *James-street, Adelphi, W.; 'Proc.' to Capt. J. E. Davis,* R.N., *Hydrographic-office.*

1874 Pass, Elias de, Esq. 2, *Kensington-gardens-terrace, Hyde-park, W.; and The Lodge, Bembridge, Isle of Wight.*

1859 2280 Pasteur, Marc Henry, Esq. 38, *Mincing-lane, E.C.*

1867 Paterson, John, Esq. 15, *Coleman-street, E.C.*

1871 Patterson, Jas. Wilson, Esq. *Roseland, Waverley, Baltimore Co., U.S.A.*

1875 Patterson, Myles, Esq. 28, *Gloucester-place, Hyde-park, W.*

1876 *Patterson, Capt. Richd. R. *The Park, Nottingham.*

1876 Patterson, Colonel Wm. Thos. Laird. 6, *Spring-gardens, S.W.*

1863 Pattinson, J., Esq. 21, *Bread-street, E.C.*

1868 Paul, J. H., Esq., M.D. *The Terrace, Camberwell, S.E.*

1858 Paul, Joseph, Esq. *Ormonde-house, Ryde, Isle of Wight.*

1876 Pauli, Capt. W. B., R.N., H.M.C., Porto Rico. *Care of Messrs. Woodhead and Co., Charing-cross, S.W.*

1874 2290 Paulson, W. H., Esq., B.A. *St. Lawrence-vicarage, Ramsgate.*

1872 Paxton, Robert Chas., Esq. 24, *Stafford-terrace, Phillimore-gardens, W.*

1877 Payne, Lieut.-Col. Geo. Massey. *East India United Service Club,* 14, *St. James's-square, S.W.*

1847 *Paynter, William, Esq., F.R.A.S. 21, *Belgrave-square, S.W.; and Camborne-house, Richmond, Surrey.*

Year of Election.	
1853	Peacock, George, Esq. *Starcross, near Exeter.*
1876	Pearcy, Joseph, Esq. 127, *Englefield-road, Islington, N.*
1863	Pearse, Captain R. B., R.N. 9, *Hyde-park-street, W.*
1877	Pearson, Arthur A., Esq. *Colonial-office, S.W.*
1874	Pechey, J. T. Primrose, Esq. *Leytonstone, Essex.*
1853	*Peckover, Alexander, Esq., F.L.S. *Wisbech.*
1875	2300*Peek, Cuthbert E., Esq. *Wimbledon-house, S.W.*
1860	*Peek, Sir Henry William, Bart., M.P. *Wimbledon-house, S.W.*
1872	*Peel, Captain Francis. *Boxted-house, Colchester.*
1858	Peel, Right Hon. Sir Robert, Bart., M.P., G.C.B. 4, *Whitehall-gardens, S.W.; and Drayton-manor, Tamworth.*
1874	*Pelham, Hon. Arthur L. *Stanmer, Lewes, Sussex.*
1875	*Pelly, Colonel Sir Lewis, K.C.S.I. *Windham Club, St. James's-square, S.W.*
1875	Pelly, Capt. Richard W., R.N. *Trinity House, Tower-hill, E.C.; and Holme-croft, Walthamstow, E.*
1871	Pembroke, George R. C. Herbert, Earl of. *Wilton-house, Salisbury; and* 10, *Victoria-square, Pimlico, S.W.*
1875	Pender, Staff-Comm. D., R.N. *Admiralty, Whitehall; and Esquimalt, Thornton-hill, Wimbledon, S.W.*
1874	Pender, H. D., Esq. 18, *Arlington-street, S.W.*
1868	2310*Pender, John, Esq. 18, *Arlington-street, S.W.*
1863	*Pennant, Colonel S. S. Douglas. *Penrhyn-castle, Bangor.*
1859	*Penrhyn, Lord. *Penrhyn-castle, Bangor.*
1874	Pepys, Hon. Walter Courtenay. *Windham Club, St. James's-square, S.W.*
1853	Percy, Lieut.-General Lord Henry M., V.C., K.C.B. (Guards). 40, *Eaton-square, S.W.*
1865	Pereira, Francisco E., Esq.
1866	Perkins, Sir Frederick, M.P. 71, *Russell-square, W.C.; and Southampton.*
1865	Perkins, William, Esq. *Rosario, Argentine Republic.*
1859	Perry, Sir Erskine, Member Indian Council. 36, *Eaton-place, S.W.*
1865	Perry, Gerald R., Esq. *British Consulate, Stockholm.*
1862	2320*Perry, William, Esq. 9, *Warwick-road, Upper Clapton, N.E.*
1876	Petch, Richd., Esq. 16, *Westbourne-park, Hyde-park, W.*
1862	Peter, John, Esq. *Conservative Club, S.W.*
1857	*Peters, William, Esq.
1860	*Petherick, John, Esq. *St. Goram Haven, St. Austell, Cornwall.*
1860	Petrie, Major Martin, 97th Regiment. *Hanover-lodge, Kensington-park, W.*
1871	Petter, G. Wm., Esq. *Streatham-grove, S.W.*
1866	Pharazyn, Robert, Esq. *Wellington, New Zealand. Care of Messrs. Scale and Rogers,* 36, *Mark-lane, E.C.*
1867	Phayre, Maj.-Gen. Sir Arthur, C.B., K.C.S.I. (Governor of Mauritius.) *Care of Messrs. H. S. King and Co.,* 45, *Pall-mall, S.W.; and E. India United Service Club, S.W.*

Year of Election.	
1862	*Phené, John Samuel, Esq., LL.D., F.S.A., F.G.S. 5, *Carlton-terrace, Oakley-street, S.W.*
1873	2330*Philbrick, Frederick Adolphus, Esq. 28, *Avenue-road, N.W.*
1860	Philip, George, Esq. 32, *Fleet-street, E.C.*
1872	Philipps, Herbert Rees, Esq. *India-office, S.W.*
1872	Philipps, Sutherland Rees-, Esq., M.D. 3, *Berkeley-place, Cheltenham.*
1857	Phillimore, R.-Admiral Augustus. *Shedfield, Fareham, Hants; and India United Service Club, S.W.*
1859	Phillimore, Charles Bagot, Esq. *Hurley Manor-house, Great Marlow; and India-office, S.W.*
1860	Phillimore, Capt. Wm. Brough (Grenadier Guards). 5, *John-st., Berkeley-sq., W.*
1875	Phillips-*Woolley*, C. L., Esq., Vice-Consul, Kertch. *Care of J. W. Sinclair, Esq.*, 2, *East India-avenue, E.C.*
1854	Phillips, Major-General Sir B. Travell. *United Service Club, S.W.*
1869	Phillips, Edwd. Aug., Esq. 11, *Great St. Helen's, E.C.*
1873	2340Phillips, Geo. W., Esq. *Care of Jno. Marsh, Esq.*, 29, *High-street, Maidstone.*
1873	Philp, Capt. Fras. Lamb (Royal Scots Greys). *Salperton-park, near Cheltenham; and Army and Navy Club, S.W.*
1871	Philpott, Edward P., Esq., M.D., LL.D. *Poole, Dorsetshire.*
1872	*Pickering, John, Esq. 28, *Springfield-mount, Leeds.*
1871	Pickersgill, Wm. Cunliffe, Esq. 58, *Prince's-gate, S.W.*
1875	Pierce, John Timbrell, Esq. (Barrister-at-law). 3, *Middle Temple-lane, Temple; St. Albans, Herts; and Reform Club, S.W.*
1871	Pierce, Josiah, Esq. 12, *Beaufort-gardens, Brompton-road, S.W.*
1870	Pigott, Robt. Turtle, Esq., D.C.L. *Manor-park, Lee, Kent; and* 36, *Southampton-street, Strand, W.C.*
1874	Pigott, Thomas Digby, Esq. *War-office, Pall-mall, S.W.*
1864	*Pigou, F. A. P., Esq. *Dartford, Kent.*
1852	2350*Pike, Captain John W., R.N. *United Service Club, S.W.*
1855	Pilkington, James, Esq. *Blackburn.*
1852	*Pim, Captain Bedford C. T., R.N., M.P. *Leaside, Kingswood-road, Upper Norwood, S.E.*; 2, *Crown-office-row, Temple, E.C.; and Senior and Junior United Service Club, S.W.*
1870	Pimblett, Rev. James. 26, *Great Avenham-street, Preston.*
1859	Pinney, Colonel William. 30, *Berkeley-square, W.*
1877	Pitcairn, Cecil Colvin, Esq., B.A. *New University Club, St. James's-street, S.W.*
1872	Plaister, W. H., Esq., M.R.C.S., &c. *Tottenham, Middlesex.*
1871	Platt, Lieut.-Colonel Chas. Rowley. 4, *Bolton-street, Piccadilly, W.*
1865	Player, John, Esq. 22, *Carpenter-road, Edgbaston, Birmingham.*
1860	Playfair, Lieut.-Col. Robert Lambert. H.B.M. Consul-General, Algiers. *Care of Messrs. H. S. King and Co.*, 45, *Pall-mall, S.W.*
1866	2360Plowden, Charles C., Esq. *The Cottage, Chislehurst, Kent.*
1856	*Plowes, John Henry, Esq. 39, *York-terrace, Regent's-park, N.W.*
1875	*Plunkett, Capt. Geo. T., R.E. *Chatham. Care of Messrs. Cox and Co., Craig's-court, S.W.*

Year of Election.	
1875	Pohl, Franz Emil F. Hugo, Esq. *Maisonnette, Clapham-common, S.W.*
1873	Pollard, Henry Thos., Esq. 4 *Threadneedle-street, E.C.*
1855	*Pollexfen, Captain J. J. *India.*
1866	*Pollington, John Horace, Viscount. 8, *John-street, Berkeley-square, W.*
1835	*Ponsonby, The Hon. Frederick G. B. 3, *Mount-street, Grosvenor-square, W.*
1870	Poole, C. M., Esq., C.E. *Care of W. T. Poole, Esq., Carnarvon.*
1877	Poole, Capt. Wm. John E. (60th Royal Rifles). 9, *Granville-park, Lewisham, S.E.*
1857	2370 Pope, Captain Wm. Agnew. *Union Club, Trafalgar-square, S.W.*
1863	*Porcher, Captain Edwin A., R.N. 60, *Chester-square, S.W.*
1874	*Porges, Theodore, Esq. 57, *Grosvenor-street, Grosvenor-square, S.W.; and Austin Friars, E.C.*
1871	*Portal, Wm. Richd., Esq., M.A. *Tonge-house, Lower Norwood, S.E.*
1868	Potter, Archibald Gilchrist, Esq. *Woodham-lodge, Lavender-hill, Wandsworth, S.W.*
1874	Potter, Richard, Esq. *Standish-house, Stonehouse, Gloucestershire.*
1867	Potter, Wm. H., Esq. *Care of G. T. White, Esq., Kinrarq, Tooting-common.*
1875	Pound, Alf. Jno., Esq., M.A. 3, *New-square, Lincoln's Inn, W.C.*
1861	*Pounden, Captain Lonsdale. *Junior United Service Club, S.W.; and Brownswood, Co. Wexford.*
1862	Povah, Rev. John V., M.A. 11, *Endsleigh-street, W.C.*
1864	2380 *Powell, F. S., Esq. 1, *Cambridge-square, Hyde-park, W.*
1874	Power, Edward, Esq. 16, *Southwell-gardens, South Kensington, S.W.*
1859	Power, E. Rawdon, Esq. (Retired List, Ceylon Civil Service). *Heywood-lodge, Tenby, South Wales; and Thatched-House Club, S.W.*
1868	Pownall, John Fish, Esq. 63, *Russell-square, W.C.*
1864	Powys, The Hon. Leopold. 16, *Queensbery-place, S.W.*
1870	*Prance, Reginald H., Esq. *Frognal, Hampstead.*
1873	Preedy, Colonel H. William. *The Chantry, Fladbury, near Pershore, Worcestershire.*
1873	Prentice, Edward, Esq. *Care of Rev. H. Waller, The Rectory, Twywell-by-Thrapston, Northamptonshire.*
1873	*Prevost, Admiral J. C. *Hillside, Camberley, Farnboro'-station, Hunts.*
1868	Price, Charles S., Esq. *Bryn Derwen, Neath.*
1869	2390 Price, F. G. H., Esq. 1, *Fleet-street, E.C.*
1869	Price, James, Esq. 8, *Howley-place, Maida-hill West.*
1852	Price, James Glenie, Esq., Barrister-at-Law. 14, *Clement's-inn, W.C.*
1873	Price, J. M., Esq., C.E.
1876	Price, Sir Rose Lambert, Bart. *Naval and Military Club, Piccadilly, W.*
1860	*Prickett, Rev. Thomas William, M.A., F.S.A. 11, *Lypiatt-terrace, Cheltenham; and United University Club, Pall-mall East, S.W.*
1868	Prideaux, Capt. W. F., Bombay Staff Corps. *Care of Messrs. King and Co., 45, Pall-mall, S.W.*
1873	Prince, John Sampson, Esq. 34, *Craven-hill-gardens, Hyde-park, W.*

Year of Election	
1865	*Pringle, A., Esq. *Yair, Selkirk, N.B.*
1855	*Pringle, Thomas Young, Esq. *Reform Club, S.W.*
1866	2400*Prinsep, Edw. Aug., Esq., B.C.S., Commissioner of Settlements in the Punjaub, *Umritsur. Care of Messrs. H. S. King and Co.*, 65, *Cornhill, E.C.*
1868	Pritchard, Lieut.-Col. Gordon Douglas. *Bengal.*
1874	Probyn, Maj.-General Sir Dighton Macnaughten, K.C.S.I., V.C., C.B. *Queen Anne's-mansion, St. James's-park, S.W.*
1874	Procter, Jno., Esq. *Cromwell-house, Long Preston, Leeds; and* 2, *Crown-office-row, Temple, E.C.*
1872	Proctor, Samuel, Esq. (Head Master, Borough Schools, San Fernando, Trinidad). *Care of E. H. Penney, Esq.*, 17, *Lime-street, E.C.*
1861	*Prodgers, Edwin, Esq. *The Rectory, Ayott St. Peter's, Herts.*
1874	Protheroe, Capt. Montague. *Care of Messrs. Grindlay and Co.*, 55, *Parliament-street, S.W.; and Junior United Service Club, S.W.*
1874	Protheroe, Pryse, Esq. *Gothic-cottage, Adelaide-road, Surbiton.*
1877	Prouse, Oswald Milton, Esq. *Leighton-house, Anerley-park, S.E.*
1852	Prout, John William, Esq., M.A., Barrister-at-Law. *Athenæum Club, S.W.; and Neasdon, Middlesex, N.W.*
1861	2410Pryce-Jones, John, Esq. *Grove-park School, Wrexham.*
1874	Pryor, Rev. Jno. Eade. *Bennington-rectory, Stevenage, Herts.*
1862	*Puget, Lieut.-Colonel J. 5, *Hyde-park-terrace, S. Kensington, S.W.*
1872	*Puleston, John H., Esq. 2, *Palace-gate, Kensington, W.*
1860	Puller, Arthur Giles, Esq. *Athenæum Club, S.W.; Arthur's Club, S.W.; and Youngsbury, Ware.*
1876	Pullman, Henry, Esq. *Grove-end, Chiswick.*
1876	Pullman, Jno., Esq. *Grove-end, Chiswick.*
1872	Punsfer, Wm. B., Esq. 1 *and* 2, *Grosvenor-villas, Merton-road, Wandsworth.*
1857	Purcell, Edward, Esq., LL.D. *Whitchurch, Monmouth.*
1869	Purdon, Lieut. George Frederic, R.N.
1865	2420*Pusey, Sidney E. Bouverie, Esq.
1870	Pycroft, Sir Thomas, K.C.S.I. 17, *Cleveland-gardens, Hyde-park, W.*
1861	Quin, Lord George. 15, *Belgrave-square, S.W.*
1868	Quin, John Thomas, Esq. *Care of Mr. Jno. B. Williams*, 36, *Hillmarten-road, Camden-road, N.*
1862	Quin, T. Francis, Esq. *Whitelands, High-street, Clapham, S.W.*
1871	Radcliffe, Sir Joseph P., Bart.
1858	*Radstock, Granville Augustus, Lord. 30, *Bryanston-square, W.*
1869	Rae, Edward, Esq. *Devonshire-road, Birkenhead.*

Year of Election.	
1876	Rae, Henry, Esq. 15, *Old-square, Lincoln's-inn; and Oxford and Cambridge Club, Pall-mall, S.W.*
1862	*Rae, James, Esq. 32, *Phillimore-gardens, Kensington, W.*
1853	2430 Rae, John, Esq., M.D., LL.D. 2, *Addison-gardens South, Holland-villas-road, Kensington, W.*
1876	Rae, Jno., Esq., F.S.A. 9, *Mincing-lane, E.C.*
1876	Rahim, Mirza Mohamed. 6, *Pembridge-terrace, Spring-grove, Isleworth.*
1875	Rahles, John, Esq. 103, *Camden-road, N.W.*
1870	Raikes, Francis Wm., Esq. *Junior Carlton Club.*
1867	Raleigh, Rev. A., D.D. 27, *Ladbroke-grove, W.*
1871	Ralli, Eustratius, Esq. 93, *Lancaster-gate, W.*
1871	Ralli, Pandeli, Esq. 17, *Belgrave-square, S.W.*
1870	Ralston, W. R. Shedden, Esq., M.A. *British Museum, W.C.*
1873	Rambaut, John, Esq., M.D. *The Grange, Godstone, Surrey.*
1866	2440 Ramsay, Alex., Esq. *Kilmorey-lodge, Castlebar, Ealing, W.*
1873	Ramsay, F. W. Hutchinson, Esq., M.D. 15, *Somerset-street, Portman-square, W.*
1867	Ramsay, John, Esq. *Islay, N.B.*
1875	Ramsay, Major Jno. *Straloch, Aberdeenshire.*
1867	*Ramsden, Richard, Esq., B.A. *Camp-hill, Nuneaton, Warwickshire.*
1869	*Randell, Rev. Thomas, B.A. *Huish's School for Boys, Taunton.*
1874	Rankin, Capt. Fras. W. *Northwick-villa, Clifton, Gloucestershire; and Junior Naval and Military Club, Pall-mall, S.W.*
1868	Rankin, William, Esq. *Tiernaleague, Carndonagh, Donegal.*
1866	*Ransom, Edwin, Esq. *Kempstone, near Bedford.*
1876	Rapier, Richard C., Esq., C.E. 5, *Westminster-chambers, S.W.*
1869	2450 Rassam, Hormuzd, Esq. *Nineveh-house, Spring-grove, Isleworth.*
1859	Ratcliff, Colonel Charles, F.S.A. *Athenæum Club, S.W.; Edgbaston, Birmingham; and Downing College, Cambridge.*
1861	Rate, Lachlan Macintosh, Esq. 9, *South Audley-street, W.*
1873	Ravenscroft, W. H., Esq. 3, *Berkeley-gardens, Campden-hill, Kensington, W.*
1859	Ravenstein, Ernest G., Esq. *Alpha-cottage, Lorn-road, Brixton, S.W.*
1875	Rawlings, H. D., Esq. *Chalk-hill, Kingsbury, N.W.*
1875	Rawlins, Wm. Donaldson, Esq., M.A. 18, *Down-street, Mayfair, W.*
1861	Rawlinson, Sir Christopher. 23, *Eaton-place, S.W.; and Aldingbourne-house, Chichester.*
1844	*Rawlinson, Major-General Sir Henry C., K.C.B., D.C.L., LL.D., F.R.S. *Athenæum Club, S.W.; and* 21, *Charles-street, Berkeley-square, W.*
1874	Rawson, Christopher, Esq. 9, *Victoria-chambers, Westminster, S.W.*
1876	2460 Rawson, Philip, Esq. *Woodhurst, Crawley, Sussex.*
1838	Rawson, Sir Rawson Wm., K.C.M.G., C.B. *Wombwell-hall, Gravesend.*
1875	Rawson, Lieut. Wyatt, R.N.
1869	Ray, Major Alfred William. *The Lodge, Brixton-oval, S.W.*
1872	Ray, George H., Esq., M.D. *Bengal.*

Year of Election	
1874	*Rayleigh, Lord. *Terling-place, Witham, Essex.*
1873	Read, Frederick, Esq. 45, *Leinster-square, W.*
1874	Read, F. W. C., Esq. *Walthamstow.*
1865	Redhead, R. Milne, Esq., F.L.S. *Springfield, Seedley, Manchester; Conservative Club, S.W.; and Junior Carlton Club, S.W.*
1868	*Redman, John B., Esq., C.E. 25, *Great George-street, S.W.*
1871	2470 Reed, Andrew Holmes, Esq. *Earlsmead, Page-green, Tottenham.*
1866	*Rehden, George, Esq. 2, *Great Tower-street, E.C.*
1861	*Reid, David, Esq.
1857	Reid, Lestock R., Esq. *Athenæum Club, S.W.; and* 122, *Westbourne-terrace, W.*
1861	Reilly, Anthony Adams, Esq. *Belmont, Mullingar.*
1869	*Reiss, James, Esq. 7, *Cromwell-road-houses, South Kensington, S.W.*
1872	Remfry, Jno., Esq. *The Grange, Nightingale-lane, Clapham-common, S.W.*
1866	*Rennie, John Keith, Esq., M.A., Camb. 2, *Eccleston-square, S.W.*
1834	*Rennie, M. B., Esq., C.E. *Care of James Rennie, Esq.,* 9, *Motcomb-street, Belgrave-square, S.W.*
1864	Rennie, W., Esq. 6, *Great Cumberland-place, W.*
1877	2480 Renshaw, Chas. B., Esq. *Elderslie, Renfrewshire, N. B.*
1830	*Renwick, General W. F., R.E. 18, *Cambridge-gardens, Kilburn, N.W.*
1861	Reuter, Julius, Baron de. *Kensington-palace-gardens, W.*
1858	Reynardson, Henry Birch, Esq. *Adwell, near Tetsworth, Oxfordshire.*
1872	Reynolds, Wm. Hy., Esq. *Care of Messrs. King and Co.,* 65, *Cornhill, E.C.*
1867	Rhodes, Arthur John, Esq. *York-villa, London-road, St. Albans.*
1874	Rhodes, Hon. Wm. Barnard, Mem. Legis. Council, New Zealand. *Wellington, New Zealand; care of Messrs. Jas. Morrison and Co.,* 4, *Fenchurch-street, E.C.*
1863	*Ricardo-Seaver, Major F. Ignacio. *Conservative Club, St. James's, S.W.*
1870	Rice, Wm., Esq. *Apsley-end, Hemel Hempstead.*
1868	Richards, Alfred, Esq. *Tewkesbury-lodge, Forest-hill.*
1874	2490 Richards, Capt. F. W., R.N. *United Service Club; and H.M.S. 'Devastation,' Channel Squadron.*
1857	Richards, Admiral George H., F.R.S., C.B. 24, *Warrington-crescent, Maida-vale, W.*
1874	Richards, M. W. Esq. *Shore-road, S. Hackney, E.*
1864	Richardson, F., Esq. *Juniper-hall, Mickleham, Dorking.*
1873	Richardson, W. Brown, Esq. *Darlaston-rectory, Wednesbury, Staffordshire.*
1875	Rider, T. F., Esq. *The Grove, Clapham-road, S.W.*
1873	Riddell, Lieut. H. S. Hutton. *Halifax, Nova Scotia.*
1876	Rideal, John, Esq. *Devon-lodge, Mayow-road, Forest-hill.*
1864	Ridley, F. H., Esq. 44, *Alexandra-road, St. John's-wood, N.W.*
1864	Ridley, George, Esq. 2, *Charles-street, Berkeley-square, W.*
1874	2500 Ridpath, James Lionel, Esq. *Devon-lawn, Wimbledon-park.*
1875	Ridpath, Thomas Alex., Esq. 9, *Belsize-park, Hampstead.*

Year of Election.	
1862	*Rigby, Major-General Christopher Palmer. *Oriental Club, W.; and* 14, *Mansfield-street, W.*
1868	Riley, Captain Charles Henry. *Junior United Service Club, S.W.*
1860	Rintoul, Robert, Esq. *Windham Club, S.W.*
1853	Ripon, Geo. Fredk. Sam., Marquis of, F.R.S. 1, *Carlton-gardens, S.W.; and Studley Royal, Ripon.*
1874	Ritchie, Rev. George St. Martin (Chaplain to the Forces).
1877	Robarts, H. C., Esq. 41, *Lowndes-square, S.W.*
1876	Roberts, Rev. Chas. M. *The Grammar-school, Monmouth.*
1868	*Roberts, Charles W., Esq. *Penrith-house, Effra-road, Brixton, S.W.*
1861	2510 Roberts, Capt. E. Wynne. 24, *Gloucester-place, Portman-square, W.; and Nutfield-lodge, Pouchen-end, Boxmoor, Herts.*
1876	Roberts, W. C., Esq. *New Zealand. Care of the Bank of New Zealand,* 50, *Old Broad-street, E.C.*
1874	Robertson, A. D., Esq. 53, *Queen's-gate, S.W.*
1865	Robertson, A. Stuart, Esq., M.D.
1860	Robertson, Sir D. Brooke, C.B., H.M. Consul. *Canton. Care of Messrs. H. S. King and Co.,* 65, *Cornhill, E.C.*
1875	Robertson, D. I. U., Esq. 174, *Chatham-street, Falkner-square, Liverpool.*
1861	*Robertson, Graham Moore, Esq. 21, *Cleveland-square, Hyde-park, W.*
1870	*Robertson, James Nisbet, Esq. *Yewlands, Banstead, Surrey.*
1868	Robertson, Rev. J. S. S., M.A., F.R.A.S. *Duncrub-castle, Duncrub-park, Dunning, Perthshire, N.B.*
1863	Robertson, R. B., Esq., H.M. Consul. *Yokohama, Japan.*
1873	2520 Robertson, Major Wheatley. 35, *Queen's-gardens, W.*
1870	Robinson, Alfred, Esq. *Elm-bank, Huddersfield.*
1875	*Robinson, Arthur M., Esq. 32, *Devonshire-road, Claughton, Birkenhead.*
1875	Robinson, Capt. F. C. B., R.N. *The Mount, Wilmington, Dartford.*
1872	Robinson, Henry, Esq., M.I.C.E., F.G.S. 7, *Westminster-chambers, S.W.*
1864	Robinson, H. O., Esq. 6, *South-street, Finsbury, E.C.*
1859	Robinson, Sir Hercules G. R., K.C.M.G. (Governor of New South Wales.) *Messrs. Burnett,* 17, *Surrey-street, W.C.*
1864	Robinson, John, Esq. *Care of E. Street, Esq.,* 30, *Cornhill, E.C.*
1874	Robinson, John, Esq., C.E. 2, *Westminster-chambers, S.W.*
1865	Robinson, J. R., Esq., LL.D., F.S.A. Scot., LL.D., F.R.S.A. du Nord, Copenhagen, F.G.S. Edin., Membre Société Asiatique de Paris, &c. *South-terrace, Dewsbury.*
1876	2530 Robinson, J. T., Esq. 20, *Bloomsbury-square, W.C.*
1862	Robinson, Colonel Sir John Stephen, Bart. *Arthur's Club, S.W.; and* 20, *Park-lane, W.*
1860	Robinson, Mr. Serjeant (B.C.). 8, *King's-Bench-walk, Temple, E.C.; and* 43, *Mecklenburgh-square, W.C.*
1855	Robinson, Thomas F., Esq., F.L.S. *Belmont-lodge, Anerley, S.E.*
1850	*Robinson, Captain Walter F., R.N. 15, *Montpellier-villas, Brighton.*

Year of Election.	
1872	Robinson, Wm., Esq. *Colonial-office, S.W.*
1870	Robinson, Hon. W. C. F., Governor of Western Australia. *Care of the Colonial-office.*
1830	*Rodd, James Rennell, Esq. 29, *Beaufort-gardens, S.W.*
1860	Roe, Capt. Hon. Jno. Septimus, Surveyor-General, W. Australia. *Care of Mrs. Ellis Jervoise, 7, Euston-place, Leamington.*
1874	Rogers, Captain Ebenezer. *S.O.P., Chester.*
1877	2540 Rogers, Edward C., Esq. *Three Counties Asylum, Stotfold, Baldock.*
1863	Rogers, John T., Esq. *River-hill, Sevenoaks.*
1874	Rogerson, Geo. Russell, Esq., F.R.A.S. *Waterloo-cottage, near Liverpool.*
1872	Rolleston, W. Vilett, Esq.
1861	Rollo, Lord. *Dumcrieff-castle, Moffat, N.B.*
1863	Rönn, M. Hermann von. *Ladbroke-lodge, Ladbroke-square, W.*
1866	Rooke, Major W., R.A. *Formosa, Lymington, Hants.*
1871	Rooks, Geo. Arthur, Esq. 24, *Old Burlington-street, W.*
1873	Rosa, Dr. Don Manuel Gonzalez de la, M.A.E. (Professor of Philosophy, University of San Marcos, Lima.) 80, *Guildford-street, Russell-sq., W.C.*
1868	Rose, Henry, Esq. 8, *Porchester-square, Hyde-park, W.*
1872	2550 Rose, H. Cooper, Esq., M.D. *Hampstead, N.W.*
1861	Rose, Jas. Anderson, Esq. *Wandsworth, Surrey, S.W.; and* 11, *Salisbury-street, W.C.*
1870	Rose, The Right Hon. Sir John. 18, *Queen's-gate, Hyde-park, S.W.*
1857	*Rose, Colonel Sir Wm. Anderson, Alderman, F.R.S.L. *Carlton Club, S.W.;* 63, *Upper Thames-street, E.C.; and Upper Tooting, S.W.*
1876	Rosenthal, L., Esq. 10, *Delamere-terrace, N.W.*
1876	Ross, Lieut.-Col. E. C. *Care of Messrs. Grindlay and Co., Parliament-street, S.W.*
1870	Ross, Capt. Geo. Ernest Augustus. *Forfar-house, Cromwell-road, South Kensington, S.W.*
1864	*Roundell, C. S., Esq. 63, *Cromwell-road, South Kensington, S.W.*
1839	*Rous, Vice-Admiral the Hon. Henry John. 13, *Berkeley-square, W.*
1864	*Routh, E. J., Esq., M.A., F.R.S., F.R.A.S., &c. *St. Peter's College, Cambridge.*
1874	2560 Routledge, Edmund, Esq. 40, *Clanricarde-gardens, Bayswater, W.*
1876	Routledge, Thomas, Esq. *Claxheugh, Sunderland.*
1872	*Row, A. V. Nursing, Esq. *Daba-garden, Vizagapatam, India. Care of Messrs. King and Co., 65, Cornhill, E.C.*
1868	*Rowlands, Percy J., Esq. *India-office, S.W.*
1863	Rowley, Captain C., R.N. 33, *Cadogan-place, S.W.*
1876	Royse, Capt. E. C., R.N. 31, *Royal-avenue, S.W.*
1856	Rucker, J. Anthony, Esq. *Blackheath, S.E.*
1876	Rudge, Wm. Newland, Esq. 9, *St. James's-street, S.W.; and Ethyl-lawn, Torquay, Devon.*
1874	Rumbold, Capt. H. E. W. *Junior United Service Club, S.W.*
1861	*Rumbold, Charles James Augustus, Esq. 5, *Percival-terrace, Brighton.*
1861	2570 Rumbold, Thomas Henry, Esq. 38, *Sussex-square, Brighton.*

Year of Election.	
1860	Rumley, Major-General Randall, 16, *Eaton-terrace, Eaton-square, S. W.*
1874	*Rusden, Geo. W., Esq. *Care of Messrs. Ashton and Co., Crown-court, Old Broad-street, E.C.*
1858	*Russell, Lord Arthur, M.P. 10, *South Audley-street, W.*
1869	Russell, George, Esq., M.A. *Viewfield, Southfields, Wandsworth; and* 16, *Old Change, St. Paul's, E.C.*
1875	Russell, James H., Esq. *St. Mary's National Schools,* 4, *Kinglake-street, Edge-hill, Liverpool.*
1830	Russell, John, Earl, F.R.S. 37, *Chesham-place, S.W.; Pembroke-lodge, Richmond; Endsleigh-house, Devonshire; and Gart-house, near Callander, N.B.*
1875	Russell, Peter N., Esq. 66, *Queensborough-terrace, Hyde-park, W.*
1875	*Russell, Robert, Esq. 42, *Albemarle-street, W.*
1875	Russell, Thomas, Esq. *Haremere-hall, Hurstgreen, Sussex.*
1876	2580 Russell, Thomas, Esq. 22, *Kensington-palace-gardens, W.*
1860	Russell, Wm. Howard, Esq., LL.D. *Carlton Club, S.W.*
1876	*Rutherford, David Greig, Esq. *Surrey-house, Forest-hill.*
1860	Rutherford, John, Esq. 2, *Cavendish-place, Cavendish-square, W.*
1876	Rutson, Albert O., Esq. 7, *Half-moon-street, W.*
1873	Ruxton, Captain W. Fitzherbert, R.N. 41, *Cornwall-gardens, S.W.*
1857	*Ryder, Admiral Alfred P., H.M.S. 'Audacious,' China. *Care of Admiralty, S.W.*
1864	Ryder, G., Esq. 10, *King's-Bench-walk, Temple, E.C.*
1868	Sabben, J. T., Esq., M.D. *Northumberland-house, Stoke Newington, N.*
1873	Sabel, Ernest E., Esq. 30, *Clarendon-gardens, Maida-hill, W.*
1852	2590 Sabine, Lieut.-General Sir Edw., K.C.B., R.A., F.R.A.S., &c. &c. 13, *Ashley-place, Victoria-street, Westminster, S.W.*
1875	Sadgrove, Arthur William, Esq. 64, *Mark-lane, E.C.; and Eltham, Kent.*
1874	St. Albans, Duke of. *Bestwood-park, Arnold, Notts.*
1869	St. Clair, Alexander Bower, Esq., H.B.M. Consul. *Jassy, Moldavia.*
1873	St. Clair, John, Esq. *Newton Stewart, Wigtonshire.*
1874	St. Jean, Le Vicomte Ernest de Satgé. *Malvern-wells; and Junior Athenæum Club.*
1867	St. John, Major Oliver Beauchamp Coventry, R.E. *Care of Messrs. H. S. King and Co.,* 65, *Cornhill, E.C.*
1862	St. John, Spenser, Esq., British Minister for Peru. *Care of J. A. St. John, Esq.,* 44, *St. John's-wood-terrace, St. John's-wood, N.W.*
1863	Sale, Captain M. T., R.E. *Chatham.*
1867	Salkeld, Colonel J. C., H.M.I. Forces. 29, *St. James's-street, S.W.*
1868	2600 Salles, J. de, Esq. 59, *Stanhope-gardens, South Kensington, S.W.*
1873	Salmon, Charles Spencer, Esq.
1869	*Salmond, Robert, Esq. *Reform Club, S.W.; and Rankinston, Patna, Ayr.*
1875	*Salomons, Sir David, Bart. *Broom-hill, Tunbridge-wells; and* 46, *Upper Berkeley-street, W.*

Year of Election.	
1863	*Salt, Henry, Esq. *Egremont, Bournemouth.*
1875	Salthouse, Rev. Robert. *St. James's-parsonage, West Derby.*
1861	Salting, William Severin, Esq. 6, *Grosvenor-gardens, S.W.*
1861	*Sandbach, Wm. Robertson, Esq. 10, *Prince's-gate, Hyde-park, S.W.*
1867	Sandeman, Captain David George. *The Ferns, Eldon-road, Kensington, W.*
1877	*Sandeman, Fleetwood, Esq. 15, *Hyde-park-gardens, W.*
1874	2610 Sanderson, Rev. Edward. *The Vicarage, High Hurst Wood, Uckfield, Sussex.*
1877	Sandilands, John Alexander, Esq. 59, *Mark-lane, E.C.*
1862	Sanford, Lieut.-Colonel Henry Ayshford. 29, *Chester-street, Grosvenor-place, S.W.; and Nynehead-court, Wellington, Somerset.*
1870	Sanford, W. Ayshford, Esq., F.R.S. *Nynehead-court, Wellington, Somerset.*
1860	Sarel, Colonel H. A., C.B., Assist.-Adj.-General S.E. District, Dover; *and United Service Club, Pall-mall, S.W.*
1869	Sarll, John, Esq. *Beauvoir-house, Hollington-park, St. Leonard's-on-Sea.*
1860	Sartoris, Alfred, Esq. *Abbottswood, Stow-on-the-Wold.*
1852	Saumarez, Rear-Admiral Thomas, C.B. *The Firs, Jersey.*
1874	Saunders, Fras., Esq. 6, *Limes-grove, Lewisham, S.E.*
1874	Saunders, Howard, Esq. 7, *Radnor-place, Gloucester-square, W.*
1866	2620 Saunders, James Ebenezer, Esq., F.L.S., F.G.S., F.R.A.S. 9, *Finsbury-circus; and Chelvistone, 36, Lee-terrace, Blackheath, S.E.*
1864	Saurin, Admiral E. *Prince's-gate, S.W.*
1863	Sawyer, Col. Charles, 6th Dragoon Guards. 25, *Queen's-gate-terrace, South Kensington, S.W.*
1875	*Schäfer, Wm. Fredk., Esq. *Lydstep-house, Highgate, N.*
1874	Schalch, Vernon Rodolph, Esq. 20, *Milton-street, Dorset-square, N.W.*
1861	Schenley, Edward W. H., Esq. 14, *Prince's-gate, S.W.*
1874	Scholfield, William F., Esq. 55, *Onslow-gardens, S.W.*
1870	Scobell, Sandford Geo. T., Esq. *Down-house, Red Marley, Gloucester.*
1875	Sconce, Gideon C., Esq. 14, *St. James's-square, S.W.*
1872	Scott, Abraham, Esq. 12, *Farquhar-road, Upper Norwood, S.E.*
1866	2630 Scott, Adam, Esq. 10, *Knatchbull-road, Camberwell.*
1875	Scott, Albert Edward, Esq. *Bishopsdown-grove, Tunbridge-Wells.*
1866	Scott, Arthur, Esq. *Rotherfield-park, Alton, Hants; and Travellers' Club, S.W.*
1873	*Scott, Dugald, Esq. *The Moorlands, Kersal-edge, Manchester.*
1859	Scott, Lord Henry. 3, *Tilney-street, Park-lane, W.*
1861	*Scott, Hercules, Esq. *Brotherton, near Montrose, N.B.*
1863	Scovell, George, Esq. 25, *Grosvenor-place, S.W.*
1873	Searight, Hugh Ford, Esq. 7, *East India-avenue, E.C.*
1861	Searight, James, Esq. 80, *Lancaster-gate, W.*
1867	Seaton, Colonel the Right Hon. Lord. *D 3, Albany, W.*
1869	2640 Sedgwick, Jno. Bell, Esq. 1, *St. Andrew's-place, Regent's-park, N.W.*

Year of Election.

1876 Seeley, Harry G., Esq., F.L.S., F.G.S., &c. 61, *Adelaide-road, N.W.*

1877 *Seely, Charles, Esq., Jun. 7, *Queen's-gate-gardens, South Kensington, W.; and Sherwood-lodge, Nottinghamshire.*

1876 Segrave, Capt. W. F., H.M. Consul. *Stockholm. Care of the Librarian, Foreign-office, S.W.*

1858 *Serocold, Charles P., Esq. *Brewery, Liquorpond-street, E.C.*

1853 Sevin, Charles, Esq. 155, *Fenchurch-street, E.C.*

1875 Sewell, Henry, Esq. 10, *Upper Westbourne-terrace, W.*

1872 Sewell, Stephen A., Esq. *City Club, Old Broad-street, E.C.*

1867 Seymour, Alfred, Esq., M.P. 47, *Eaton-square, S.W.*

1872 *Seymour, Admiral F. Beauchamp, C.B. *Admiralty, Whitehall, S.W.*

1858 2650 Seymour, George, Esq. 12, *Lower Phillimore-place, Kensington, W.*

1853 *Seymour, Henry Danby, Esq. *Athenæum Club, S.W.; Knoyle-house, Hindon, Wilts.*

1873 *Seymour, Brig.-General W. H., C.B. *United Service Club, Pall-mall, S.W.*

1854 *Shadwell, Admiral Sir Charles F. A., K.C.B., F.R.S. *Meadow-bank, Melksham, Wilts.*

1860 *Shadwell, Lieut.-Colonel Lawrence.

1874 Shanks, Major Joseph G., R.M.L.I. *Plymouth, Devon.*

1856 *Share, Staff-Commander James Masters, R.N. *Seaview-terrace, Lipson-road, Plymouth.*

1873 *Sharp, Colin Kimber, Esq. 43, *Tregunter-road, West Brompton, S.W.*

1873 Sharp, Captain Cyril. 7, *Thurloe-square, S.W.*

1866 Sharp, Henry T., Esq. 8, *Park-lane, Mayfair, W.*

1875 2660 Sharp, Thos. Clark, Esq. 80, *Kensington-gardens-square, W.*

1861 *Sharpe, William John, Esq. 1, *Victoria-street, Westminster, S.W.; and Norwood, Surrey, S.E.*

1874 Shaw, C. Bousfield, Esq. 26, *Charles-street, St. James's; and 2, Essex-court, Temple.*

1876 Shaw, Geo., Esq. 7, *Garrick-street, W.C.; and Oakwood-house, Rostrevor, Ireland.*

1862 *Shaw, John, Esq. *Finegand, Otago, New Zealand. Care of Messrs. Reith and Wilkie, Dunedin, Otago, N.Z. Per Messrs. Sampson Low and Co.,* 188, *Fleet-street, E.C.*

1861 Shaw, John Ralph, Esq. *Arrowe-park, Birkenhead.*

1870 *Shaw, Robert B., Esq. (British Joint Commissioner). *Ladak, Punjab, East Indies. Care of General Younghusband,* 106, *Pembroke-road, Clifton.*

1876 Shaw, W. Otho Nicholas, Esq. 35, *Queen's-gate, South Kensington, S.W.*

1870 *Shearme, Edward, Esq. *Junior Athenæum Club, W.*

1875 Shelley, Edward, Esq. *Avington, Winchester.*

1868 2670 *Shelley, Captain G. Ernest. 32, *Chesham-place, S.W.*

1867 Shenstone, Fredk. Smith, Esq. *Sutton-hall, Barcombe, Lewes.*

1875 Shepheard, Chas. Edwd., Esq., C.E. *Beaumont-house, Ealing.*

1867 Shepherd, Chas. Wm., Esq., M.A., F.Z.S. *Trottersoliffe, Maidstone.*

Year of Election.	
1860	Sheridan, H. Brinsley, Esq., M.P. *New City Club, E.C.*
1863	Sheridan, Richard B., Esq. 39, *Grosvenor-place, S.W.*
1857	Sherrin, Joseph Samuel, Esq., LL.D., PH.DR. *Leyton-house, Leyton-crescent, Kentish-town, N.W.*
1859	*Sherwill, Lieut.-Col. W. S., F.G.S. *Perth, N.B.*
1858	*Shipley, Conway M., Esq. *Twyford-moors, Winchester.*
1868	Shirley, Lionel H., Esq., C.E., &c. *Windham Club, S.W.; and* 9, *Queen's-gate-terrace, S.W.*
1871	2680*Shoolbred, James, Esq. 38, *Lancaster-gate, Hyde-park, W.*
1873	Short, Robert, Esq. 42, *Hillmarten-road, Camden-road, N.*
1872	*Shuter, William, Esq. 66, *Belsize-park-gardens, Haverstock-hill, N.W.*
1856	Shuttleworth, Sir J. P. Kay, Bart. 3, *Victoria-street, S.W.; and Gawthorp-hall, Burnley, Lancashire.*
1876	*Sibley, George, Esq., C.E. *The Mount, Whitehill, Caterham, Surrey.*
1876	Sidney, Capt. Fred. W., R.N. 3, *Approach-road, Lower Norwood, S.E.*
1869	Silk, George Chas., Esq. *The Vicarage, Kensington, W.*
1871	*Sills, Wm. Bernard, Esq. 19, *Beaufort-gardens, S.W.*
1870	Silva, Emanuel, Esq. 8, *Sheen-villas, Park-road, Richmond.*
1865	*Silva, Frederic, Esq. 97, *Westbourne-terrace, Hyde-park, W.*
1859	Silver, the Rev. Fred., M.A., F.R.A.S., F.G.S., F.L.S. *Rectory, Norton-in-Hales, Market Drayton, Salop.*
1859	2690*Silver, Stephen Wm., Esq. 66, *Cornhill, E.C.; and* 3, *York-gate, Regent's-park, N.W.*
1853	Simmons, Edw. R., Esq., Barrister-at-Law. *Nevill-house, Belgrave-terrace, Brighton.*
1848	*Simmons, Lieut.-General Sir John L. A., R.E., K.C.B. 36, *Cornwall-gardens, Kensington, S.W.*
1866	Simons, Henry M., Esq. *Tyersall-crescent, Wood-road, Sydenham-hill, S.E.*
1864	Simpson, Frank, Esq. 17, *Whitehall-place, S.W.*
1863	*Simpson, William, Esq. 64, *Lincoln's-inn-fields, W.C.*
1866	*Sims, Richard Proctor, Esq., C.E. *Malabar-hill, Bombay. Care of Messrs. H. S. King and Co., Cornhill, E.C.*
1858	Skelmersdale, Edward, Lord. *Lathom-park, Ormskirk, Lancashire.*
1875	Skertchly, Joseph A., Esq. 189, *Glenarm-road, Clapton-park, E.*
1872	Skilbeck, A. Jos., Esq. 202, *Upper Thames-street, E.C.*
1873	2700Skilbeck, Jno. Hy., Esq. *The Hollies, Snaresbrook, Leytonstone, E.*
1866	Skinner, John E. H., Esq. 3, *Dr. Johnson's-buildings, Temple, E.C.*
1863	Skrine, Henry D., Esq. *Warleigh-manor, near Bath.*
1871	Slade, Henry, Esq., Fleet-Surgeon, R.N. *Army and Navy Club, S.W.; and Royal Western Yacht Club, Plymouth.*
1870	Sladen, Major E. B. *Care of Messrs. Grindlay and Co.,* 55, *Parliament-street, S.W.*
1861	Sladen, Rev. Edward Henry Mainwaring. *The Gore, Bournemouth.*
1872	Smale, Sir John, Chief Justice, Hong-Kong. 26, *Kensington-square, W.*
1865	Smedley, Joseph V., Esq., M.A. *Oxford and Cambridge Club, S.W.*

Year of Election

1871 Smetham, John Osborne, Esq. *King's Lynn, Norfolk.*

1860 2710*Smith, Augustus Henry, Esq. *The Ridge, Bitterne, Southampton.*

1875 *Smith, B. Leigh, Esq., M.A. *Oxford and Cambridge Club, Pall-mall, S.W.*

1876 Smith, Bridgman, Esq. 27, *Lloyd-square, W.C.*

1871 Smith, Major C. B. Euan, C.S.I. 14, *St. James's-square, S.W.* *Care of Messrs. King and Co., Cornhill, E.C.*

1875 Smith, David Murray, Esq. 20, *Oxford-street, Edinburgh.*

1859 Smith, Edward, Esq. *Windham Club, S.W.*

1873 Smith, F. Porter, M.B. *Shepton Mallet, Somersetshire.*

1871 Smith, Geo. Fereday, Esq., M.A., J.P., &c. *Grovehurst, Tunbridge-wells.*

1873 Smith, Griffiths, Esq. 7, *Endsleigh-street, Tavistock-square, W.C.*

1865 Smith, Guildford, Esq. 63, *Charing-cross, S.W.*

1861 2720Smith, Jervoise, Esq. 47, *Belgrave-square, S.W.*

1853 Smith, John Henry, Esq. 1, *Lombard-street, E.C.; and Purley, Croydon, Surrey.*

1876 Smith, J. L. Clifford, Esq. *Beverley-terrace, Halifax.*

1861 *Smith, Joseph Travers, Esq. 25, *Throgmorton-street, E.C.*

1857 Smith, Colonel Philip (Grenadier Guards). 6, *James-street, Buckingham-gate, S.W.*

1874 *Smith, R. Barr, Esq. *Torrens-park, Adelaide, S. Australia.*

1868 *Smith, Major Robert M., R.E. *Teheran.*

1874 Smith, Rupert, Esq. *Turner's-hill, near Dudley.*

1841 *Smith, Thomas, Esq.

1859 *Smith, W. Castle, Esq. 1, *Gloucester-terrace, Regent's-park, N.W.*

1859 2730Smith, William Henry, Esq., M.P. 1, *Hyde-park-street, W.*

1875 Smith, Wm. Hy., Esq. *Care of Messrs. Allan Bros., and Co., James-street, Liverpool.*

1875 Smith, William Howarth Glynn, Esq. 24, *Delamere-crescent, W.*

1857 *Smith-Bosanquet, Horace, Esq. 38, *Queen's-gate, South Kensington, S.W.*

1869 Smyth, Colonel Edmund. *Welwyn-grange, Herts.*

1869 *Smyth, Warington, Esq., F.R.S. 92, *Inverness-terrace, W.*

1837 *Smyth, Rear-Admiral William. *Care of Messrs. Child and Co., Temple-bar, E.C.*

1850 *Smythe, Major-General William J., R.A., F.R.S. *Athenæum Club, S.W.*

1872 Snooke, William, Esq. 20, *Northampton-park, Canonbury, N.*

1876 Solbé, Edward, Esq. *Palace-grove, Bromley.*

1865 2740*Solomons, Hon. George. *Jamaica.*

1839 *Somers, Charles, Earl. 49, *Prince's-gate, S.W.; Eastnor-castle, Herefordshire; and The Priory, Reigate, Surrey.*

1862 Somerset, Capt. Leveson E. H., R.N. *Care of Messrs. Chard,* 3, *Clifford's-inn, Fleet-street, E.C.*

1876 Somerville, Dr. Thomas, LL.D. *Hawthorn-hall, Wilmslow, Cheshire.*

1860 Southesk, The Right Hon. James Carnegie, Earl of. *Kinnaird Castle, Brechin, N.B.*

Year of Election.

1860 *Southey, James Lowther, Esq. *Admiralty Transport-office, Drury-buildings, Liverpool.*

1869 Southwell, Thomas Arthur Joseph, Viscount. *Windham Club, S.W.*

1872 Spalding, Captain H. (104th Regiment). *Dover.*

1865 Spalding, Samuel, Esq. *Thornleigh, Sydenham-hill, S.E.*

1870 Sparks, J. Hyde, Esq. *Conservative Club, S.W.*

1874 2750 Sparrow, William, Esq. *Albrighton-hall, Shrewsbury.*

1873 Spence, Jas. Mudie, Esq. *Erlington-house, Whalley-range, Manchester.*

1873 Spence, Jno. Berger, Esq., F.G.S., &c. *Erlington-hall, Whalley-range, Manchester.*

1870 Spencer, Admiral the Hon. J. W. S. 5, *Portman-street, W.*

1874 Spencer, Walter, Esq. 10, *Guilford-place, Russell-square, W.C.; and Cavendish Club,* 307, *Regent-street, W.*

1867 Spicer, Edward, Esq. 19, *New Bridge-street, E.C.*

1874 Spicer, Jas., Esq. *The Harts, Woodford, Essex.*

1874 Spicer, Capt. Richard W. 3, *Chesham-place, Belgrave-square, S.W.*

1863 Spickernell, Dr. Geo. E., Principal of Eastman's Royal Naval Establishment. *Eastern-parade, Southsea.*

1855 *Spottiswoode, William, Esq., F.R.S. 41, *Grosvenor-place, S.W.*

1859 2760 *Spratt, Rear-Admiral Thos. A. B., C.B., F.R.S. *Clare-lodge, Nevill-park, Tunbridge-wells, Kent.*

1866 Spruce, Richard, Esq., PH.DR. *Coneysthorpe, Malton, Yorkshire.*

1871 Square, William, Esq., F.R.C.S. 22, *Portland-square, Plymouth.*

1853 Stanford, Edward, Esq. 55, *Charing-cross, S.W.*

1860 *Stanhope, Walter Spencer, Esq. *Cannon-hall, Barnsley, Yorkshire.*

1875 Stanley, Hon. E. Lyulph. 82, *Harley-street, W.*

1870 Stanley, Lieut. Henry, R.N. *Admiralty Survey, Melbourne.*

1872 *Stanley, Walmsley, Esq., C.E. *East-mansion, West Worthing.*

1869 Stanton, Charles Holbrow, Esq. 65, *Redcliffe-gardens, S.W.*

1875 *Stanton, Edwd. Wm., Esq., M.A. 5, *Verulam-buildings, Gray's-inn, W.C.*

1863 2770 Stanton, George, Esq. *Coton-hill, Shrewsbury; and Conservative Club, S.W.*

1867 Stanton, Henry, Esq. 1, *River-street, Myddelton-square, E.C.*

1871 Stark, Wm. Emery, Esq. *Rydal-lodge, New-park-road, Brixton-hill.*

1870 Starling, Joseph, Esq. *Beresford-lodge, Dyke-road, Brighton.*

1868 Staveley, Major-Gen. Sir Charles, K.C.B., Commander-in-chief, Bombay. *Care of Mr. H. Saunders,* 24, *Tichborne-street, W.; and United Service Club, S.W.*

1863 *Staveley, Miles, Esq. *Old Sleningford-hall, Ripon.*

1869 Stebbing, Edward Charles, Esq. *National Debt Office,* 19, *Old Jewry, E.C.; and The Aspens, Sunbury.*

1867 Steel, Major J. P., R.E. *Simla. Care of the Oriental Bank,* 40, *Threadneedle-street, E.C.*

1868 Steel, William Strang, Esq. 65, *Lancaster-gate, Hyde-park, W.*

1876 Steele, James Dickson, Esq. *H.M. Female Convict Prison, Woking, Surrey.*

1871 2780 Stein, Hon. Robert. *Port Louis, Mauritius. Care of Messrs. Hodgson, Stein, and Co.,* 22, *Basinghall-street, E.C.*

Year of Election.	
1870	Stenning, Charles, Esq. 3, *Upper Hamilton-terrace, N.W.*
1830	*Stephen, Sir George. *Melbourne. Care of Mr. H. W. Ravenscroft,* 15, *John-street, Bedford-row, W.C.*
1874	Stephens, Harold, Esq. *Finchley, N.W.*
1870	*Stephens, Thomas Wall, Esq. 112, *Queen's-gate, South Kensington, S.W.*
1869	Stephenson, B. Charles, Esq. 12, *Bolton-row, Mayfair, W.*
1876	Stephenson, Jno. Hunter, Esq. 3, *Newman's-court, Cornhill, E.C.*
1857	Stephenson, Sir R. Macdonald, C.E. 72, *Lancaster-gate, W.; and East-cottage, Worthing.*
1866	Stepney, A. K. Cowell, Esq. 6, *St. George's-place, Knightsbridge, S.W.*
1877	Sterndale, Robert A., Esq. *Lime-cottage, Thames Ditton, Surrey.*
1869	2790 Steuart, Colonel T. R., Bombay Army. *Esgair, Machynlleth, Wales.*
1874	Stevens, George Richard, Esq. 2, *Phillimore-terrace, Allen-street, Kensington, W.*
1855	Stevens, Henry, Esq., F.S.A. 4, *Trafalgar-square, W.C.*
1841	Stevenson, Thomas, Esq., F.S.A. *Iver Heath, Bucks.*
1874	Steward, Major Edward H., R.E. *War-office, Whitehall, S.W.*
1869	Stewart, Major C. E., I.A., Bengal Staff Corps. *Care of Sir Thos. Dyer,* K.C.B., 14, *Redcliffe-square, S.W.*
1874	Stewart, Gilbert McLeod, Esq. 1, *Westminster-chambers, S.W.*
1876	Stewart, H., Esq. 58, *Bruton-street, W.*
1871	*Stewart, Captain Herbert, 3rd Dragoon Guards. *Staff-college, Farnboro'-station, Hants.*
1866	Stewart, Rev. Dr. James. *Lovedale, Alice, South Africa. Care of Robert Young, Esq., Offices of the Free Church of Scotland, Edinburgh.*
1860	2800 *Stewart, Major J. H. M. Shaw (Royal Madras Engineers).
1874	Stewart, Robert, Esq. *Port Elizabeth, Cape of Good Hope. Care of Standard Bank,* 10, *Clement's-lane, Lombard-street, E.C.*
1872	Stewart, Wm., Esq., M.D.
1873	Stewart, Admiral Wm. Houston, C.B. 53, *Warwick-square, S.W., and Admiralty S.W.*
1870	Stilwell, Henry, Esq., M.D. *Moarcroft, Hillington, Uxbridge.*
1875	Stirling, Arthur F. G., Esq. 2, *Mitre-court-buildings, Temple, E.C.*
1875	Stirling, Sir Chas. E. F., Bart. 16, *Bryanston-square, W.; Glorat, near Glasgow; and Junior Carlton Club.*
1860	Stirling, Capt. Frederick H., R.N. *United Service Club, S.W.*
1875	*Stirling, J. Carolus, Esq. 9, *South Eaton-place, S.W.*
1863	Stirling, Sir Walter, Bart. 36, *Portman-square, W.*
1860	2810 Stocker, John Palmer, Esq. 93, *Oxford-terrace, Hyde-park, W.*
1845	*Stokes, Vice-Admiral John Lort. *United Service Club, S.W.; and Scotchwell, Haverfordwest, Wales.*
1868	Stone, David H., Esq., Alderman. 7, *Bucklersbury, E.C.*
1874	Stone, Octavius, C., Esq. *Springfield, Nuneaton.*
1867	*Story, Edwin, Esq., M.A. 88, *Oldfield-road, Stoke Newington, N.*
1868	Stovin, Rev. Charles F. 59, *Warwick-square, S.W.*

Year of Election.	
1873	Stow, Geo. W., Esq. *Queen's Town, S. Africa.*
1866	Strachey, Major-General Richard, R.E., C.S.I., F.R.S. *Stowey-house, Clapham-common, S.W.; and India-office, S.W.*
1858	Stratford de Redcliffe, Stratford Canning, Viscount. 29, *Grosvenor-square, W.*
1864	Straton, Rev. N. D. J. *The Vicarage, Wakefield.*
1873	2820 Straughton, Joseph, Esq. *Cockermouth, Cumberland.*
1875	Streeter, Alfred, Esq. 5, *Henwood-road, Rotherhithe, S.E.*
1860	Strickland, Edward, Esq., C.B., Commissary-General. *Care of Sir Chas. R. M'Grigor, Bart., and Co., 25, Charles-street, St. James's-square, S.W.*
1868	*Strode, Alf. Rowland Chetham, Esq. *Dunedin, Otago, New Zealand.*
1875	Strong, Alfred, Esq. 7, *Burlington-road, St. Stephen's-square, Bayswater.*
1853	Strousberg, Dr. Bethel Henry.
1874	Strousberg, Hy., jun., Esq.
1853	Strutt, George H., Esq., F.R.A.S. *Bridge-hill, Belper.*
1876	Stuart, Alexander, Esq. 8, *Powis-square, Kensington, W.*
1873	Stuart, Lieut.-Gen. Charles. 5, *Granville-place, Portman-square, W.*
1859	2830 Stuart, Lieut.-Col. J. F. D. Crichton. 25, *Wilton-crescent, Belgrave-square, S.W.*
1875	*Stuart, James Meliss, Esq. *Oakenshaw, Upper Norwood.*
1866	Stuart, Major Robert. *Janina, Albania.*
1876	*Stuart, Colonel S. William. 36, *Hill-street, W.*
1873	Sturgeon, Wentworth, Esq. *The Rockingham Clay-works, West Wellow, Romsey, Hants.*
1876	Sturman, Rev. M. C. T. 54, *Talfourd-road, Camberwell, S.E.*
1872	Sturt, Henry, Esq., jun. 119, *Holland-road, Kensington, W.*
1872	Styan, Arthur, Esq., F.S.A. 28, *Norfolk-crescent, Hyde-park, W.*
1858	Sudeley, Charles G. Hanbury Tracy, Lord. 5, *Bolton-row, W.; and Toddington, near Broadway, Worcester.*
1857	Sulivan, Rear-Admiral Sir Bartholomew J., R.N., K.C.B. *Bournemouth.*
1873	2840 Sullivan, Sir Edwd., Bart. 13, *Grosvenor-place, S.W.*
1865	Sullivan, Captain T. W., C.B., R.N.
1869	Summerhayes, William, Esq., M.D.
1862	Surridge, Rev. Henry Arthur Dillon, M.A. 21, *Berners-street, W.*
1862	Surtees, Colonel Charles Freville. *Chalcott-house, Long Ditton, Surrey.*
1873	Sutherland, Geo., Esq. *Arboretum-square, Derby.*
1861	*Sutherland, George Granville William, Duke of, F.R.S. *Stafford-house, St. James's-palace, S.W.*
1869	Sutherland, Robert, Esq. *Egham-rise, Surrey.*
1869	Sutherland, Thomas, Esq. 38, *Thurloe-square, S.W.*
1874	Sutton, John Manners, Esq. *Kilham-hall, Newark, Notts.*
1871	2850 Sutton, W. P., Esq., LL.D., F.S.A., &c.
1873	Suzuki, Kinzo (Sec. of Japanese Leg.). 9, *Kensington-park-gardens, W.*
1875	Swain, Edward, Esq. *Three Counties Asylum, Stotfold, Baldock.*
1876	Swaine, Capt. Leopold Victor. 14, *Queen's-gate, S.W.*

Year of Election.	
1875	Swann, Rev. P. F., M.A. *Brandsby, Easingwold, Yorkshire.*
1857	Swanzy, Andrew, Esq. *Sevenoaks, Kent.*
1875	Swart, Hon. N. J. R. *Pretoria, S. African Republic; care of J. J. Pratt, Esq., 24, Coleman-street, E.C.*
1862	*Swinburne, Commr. Sir John, Bart., R.N. *Capheaton, Newcastle-on-Tyne.*
1863	Swinhoe, R., Esq. 33, *Carlyle-square, S.W.*
1871	Syme, Henry, Esq. 60, *Palace-gardens-terrace, Campden-hill, W.*
1864	2860 Symonds, F., Esq., M.D. *Beaumont-street, Oxford.*
1875	Symons, Lieut. J. E., R.N. 3, *Lansdowne-terrace, Cheltenham.*
1852	*Synge, Colonel Millington H., R.E. *United Service Club, Pall-mall, S.W.*
1875	Szlumper, Jas. Weeks, Esq., C.E., F.G.S. *Aberystwyth.*
1852	Tagart, Courtenay, Esq. *Reform Club, Pall-mall.*
1859	Tagart, Francis, Esq. 31, *Craven-hill-gardens, Hyde-park, W.*
1866	Taintor, Edward C., Esq. PH. D. (Imperial Chinese Customs). *China. Care of J. D. Campbell, Esq., 8, Storey's-gate, S.W.*
1857	*Tait, Robert, Esq. 14, *Queen Anne-street, W.*
1861	Talbot de Malahide, James Talbot, Lord, F.R.S. *Malahide Castle, Co. Dublin.*
1861	Taylor, Commander A. Dundas, I.N. (Director of Marine Surveys), Calcutta. *Care of Messrs. H. S. King and Co., 65, Cornhill, E.C.*
1875	2870 Taylor, C. A., Esq. *Boughton-place, Maidstone.*
1873	Taylor, Charles, Esq. *Church-house-school, Ealing, W.*
1876	Taylor, Fras. Clement, Esq. *Summerleaze, East Harptree, near Bristol.*
1869	Taylor, George N., Esq. 31, *Cornwall-gardens, Queen's-gate, S.W.*
1865	Taylor, H. L., Esq. *Reform Club, S.W.; and 23, Phillimore-gardens, Kensington, W.*
1874	Taylor, Jas. Benjamin, Esq. *Piersfield, Lower Streatham, Surrey.*
1865	Taylor, Rev. Jas. Hudson. 6, *Pyrland-road, Newington-green, N.*
1871	*Taylor, John, Esq. *The Rocks, Bath; and Booth-hall, Blackley, Lancashire.*
1863	Taylor, John, Esq. 110, *Fenchurch-street, E.C.*
1870	*Taylor, John Fenton, Esq. 20, *New-street, Spring-gardens, S.W.*
1867	2880 *Taylor, John George, Esq. H.B.M. Consul in Kurdistan, Diarbekir. *Care of Messrs. O'Brien and Co., 43, Parliament-street, S.W.*
1854	*Taylor, John Stopford, Esq., M.D. 1, *Springfield, St. Anne-street, Liverpool.*
1863	Taylor, Maj.-Gen. R. C. H., C.B. 16, *Eaton-place, S.W.; and Carlton Club, S.W.*
1873	Taylor, Wm. Richard, Esq., Deputy-Commissary. *Fort George, Inverness-shire.*
1875	Tedlie, Lieut.-Colonel William. 3, *The Grove, Boltons, South Kensington, S.W.*
1873	Teede, Chas., Esq. 12, *Granville-park, Blackheath.*
1875	Telfer, Commr. Buchan, R.N. 14, *Sumner-place, Onslow-square, S.W.*
1876	Temple, Lieut. Geo., R.N. *The Nash, near Worcester.*

Year of Election.	
1864	Temple, Sir Richard, K.C.S.I.
1860	Templeton, John, Esq. 24, *Budge-row, E.C.*
1857	2890 Tennant, Professor James. 149, *Strand, W.C.*
1873	Terashima, Munenori (His Japanese Majesty's Envoy Extraordinary and Minister). 9, *Kensington-park-gardens, W.*
1872	Terrero, Maximo, Esq. 88, *Belsize-park-gardens, N.W.*
1870	Teschemacher, Edward Fred., Esq. 1, *Highbury-park-north, N.*
1830	*Thatcher, Colonel. E.I.C.
1874	Thomas, Chas. Evan, Esq. 98, *Queen's-gate, S.W.*
1863	Thomas, G., Esq.
1872	Thomas, James Lewis, Esq., War-office, Horse Guards. 26, *Gloucester-street, Warwick-square, S.W. and Thatched-House Club, St. James's-street, S.W.*
1865	Thomas, John Henwood, Esq. *East India Dept., Custom-house, E.C.*
1864	Thomas, J. R., Esq., Staff Assist. Surg. *Castle-hill, Fishguard, Pembrokeshire.*
1874	2900 Thomas, R. Gerard de V., Esq., M.A. *Eyhorne-house, Maidstone; and Universities Club, Jermyn-street, S.W.*
1875	Thomas, Wesley Hy., Esq. *The Yews, Walthamstow, Essex.*
1875	Thompson, John Geo., Esq., M.A. *St. Mary's College, Peckham, S.E.*
1876	Thompson, Major H., Bengal Staff Corps. *Care of Messrs. Grindlay and Co., 55, Parliament-street, S.W.*
1869	*Thompson, Henry Yates, Esq. 32, *Ennismore-gardens, S.W.*
1872	Thompson, Lieut. Richard, R.E. 22, *St. Mary's, Bedford.*
1874	Thompson, Thomas, Esq. *Durban, Natal, South Africa.*
1863	Thomson, James, Esq. *Dunstable-house, Richmond.*
1863	Thomson, James Duncan, Esq., Portuguese Consul. *St. Peter's-chambers, Cornhill, E.C.*
1866	Thomson, John, Esq. 12, *Elgin-gardens, Effra-road, Brixton, S.W.*
1848	2910 *Thomson, J. Turnbull, Esq., Chief Surveyor. *Wellington, New Zealand.*
1861	*Thomson, Ronald Ferguson, Esq. *Care of Messrs. O'Brien and Co., 43, Parliament-street.*
1854	*Thomson, Thomas, Esq., M.D., F.R.S. 6, *Bower-terrace, Maidstone.*
1865	Thomson, W. T., Esq.
1862	*Thorne, Augustus, Esq. *Belgrave-mansions, Grosvenor-gardens, S.W.*
1876	Thornhill, Capt. Jas. Alfred. *Bradbourne-villas, Bushey-hill, Camberwell.*
1867	Thornton, Edward, Esq., C.B. *Harrow.*
1847	Thornton, Rev. Thomas Cooke, M.A., M.R.I.A. *Brock-hall, near Weedon, Northamptonshire.*
1858	Thorold, Rev. A. W. 31, *Gordon-square, W.C.*
1868	Thorold, Alexander W. T. Grant, Esq. 3, *Grosvenor-gardens, S.W.*
1877	2920 Thorpe, Geo., Esq. 20, *Eastcheap, E.C.*
1871	Thorpe, Wm. Geo., Esq., F.G.S. *Gloucester-house, Larkhall-rise, S.W.; and Barton's-house, Ipplepen, Newton Abbot, Devon.*
1877	Thring, Sir Henry, K.C.B. 18, *Queen Anne's-gate, S.W.*
1859	Thuillier, Colonel H. L., C.S.I., Surveyor-General of India, F.R.S. *Calcutta. Care of Messrs. Grindlay and Co., 55, Parliament-street.*

Year of Election.	
1872	Thuillier, Capt. Hy. R., R.E. *Messrs. King and Co., Pall-mall.*
1865	*Thurburn, C. A., Esq. 16, *Kensington-park-gardens, Notting-hill, W.*
1861	Thurlow, The Right Hon. Lord. *Dunphail, Forres, N.B.*
1874	Thwaites, Capt. Joseph. 5, *Washington-terrace, Southampton.*
1874	Tighe, Col. Fred. *The Priory, Christchurch, Hants; and Travellers' Club, S.W.*
1868	Tilley, Henry Arthur, Esq.
1872	2930 Tinline, George, Esq. 17, *Prince's-square, Bayswater, W.*
1874	*Tinné, J. Ernest, Esq. *Briarley, Aigburth, near Liverpool.*
1839	*Tinne, John A., Esq. *Briarley, Aigburth, near Liverpool.*
1873	Tipping, George B., Esq. *Coombe-lodge, Kingston-hill, Surrey.*
1866	Tizard, Staff-Commander J. H., R.N. *Hydrographic-office, Admiralty, S.W.*
1862	Todd, John, Esq. *Aukland-lodge, Blackheath, S.E.*
1865	Todd, Rev. John W., D.D. *Tudor-hall, Forest-hill, Sydenham, S.E.*
1876	Tollemache, Hon. Hamilton. 8, *St. James's-square, S.W.*
1853	*Tomlin, George Taddy, Esq., F.S.A. *Combe-house, Bartonfields, Canterbury.*
1853	Tomline, George, Esq. 1, *Carlton-house-terrace, S.W.*
1873	2940 Tomlinson, John, Esq. *St. Peter's-college, Peterborough.*
1875	Tomlinson, Walter, Esq., B.A. 3, *Richmond-terrace, Whitehall, S.W.*
1877	*Tomlinson, W. E. M., Esq., M.A. 3, *Richmond-terrace, Whitehall, S.W.; and Athenæum Club, S.W.*
1856	Torrance, John, Esq. 5, *Chester-place, Hyde-park-square, W.*
1866	Torrens, Sir Robert Richard, K.C.M.G. 12, *Chester-place, W.; and The Cott, Holm, near Ashburton, South Devon.*
1875	Townshend, Capt. F. French (2nd Life Guards). *Arthur's Club, St. James's-street, S.W.*
1859	Townshend, Commander John, R.N. 12, *Macaulay-road, Clapham, S.W.*
1846	*Towry, George Edward, Esq.
1873	Towse, John Wrench, Esq. *Fishmongers'-hall, London-bridge, E.C.*
1858	Towson, J. Thomas, Esq. 47, *Upper Parliament-street, Liverpool.*
1864	2950 *Toynbee, Capt. Henry. 12, *Upper Westbourne-terrace, W.*
1863	*Tozer, Rev. H. F., M.A. *Exeter College, Oxford.*
1864	Tracy, The Hon. C. H. 68, *Eccleston-square, S.W.*
1863	*Travers, Arch., Esq. 28A, *Addison-road, Kensington, W.*
1876	Travers, Lieut.-Gen. James, V.C. *Care of Messrs. King and Co., 65, Cornhill, E.C.*
1867	Tremenheere, Lieut.-General C. W., C.B., R.E. 1, *Porchester-square, Bayswater.*
1859	Tremlett, Rev. Francis W., M.A., D.C.L., PH.D. *Belsize-park, Hampstead, N.W.*
1865	*Trench, Major the Hon. Le Poer, R.E. 32, *Hyde-park-gardens, W.; and Ordnance Survey-office, Pimlico, S.W.*
1863	Trestrail, Rev. Frederick. *St. John's-road, Newport, Isle of Wight.*
1872	Treuenfeld, Richard von F., Esq. 12, *Queen Anne's-gate, Westminster, S.W.*
1862	2960 Trevelyan, Sir Charles Edward, Bart. K.C.B. 8, *Grosvenor-crescent, S.W.*
1830	Trevelyan, Sir Walter Calverly, Bart., M.A., F.S.A., F.L.S., F.R.S.N.A., &c. *Athenæum Club, S.W.; Wallington, Northumberland; and Nettlecombe, Somerset.*

Year of Election.	
1864	Trimmer, Edmund, Esq. 41, *Botolph-lane, E.C.*
1875	Trinder, Hy. Wm., Esq. *Queen Anne's-mansions, S.W.*
1867	Tritton, Joseph Herbert, Esq. 54, *Lombard-street, E.C.*
1871	Trivett, Captain John Fredk., R.N.R.. *The Homestead, Hackney-common, N.E.*
1876	*Trotter, Coutts, Esq. *Athenæum Club, Pall-mall, S.W.*
1869	Trotter, Capt. Henry, R.E. *Care of Messrs. Richardson,* 23, *Cornhill, E.C.*
1872	Trotter, Captain J. Moubray. *Naval and Military Club, Piccadilly, W.*
1874	*Trotter, William, Esq. 11, *Hertford-street, Mayfair, W.*
1870	2970 Trutch, J. W., Esq. (Chief Commissioner of Lands and Works). *British Columbia.*
1867	Tryon, Captain George, R.N., C.B. *Army and Navy Club, S.W.*
1862	Tuckett, Francis Fox, Esq. *Frenchay, near Bristol.*
1865	Tuckett, Philip D., Esq. *Southwood-lawn, Highgate, N.*
1852	Tudor, Edward Owen, Esq., F.S.A. 1, *Portugal-street, Grosvenor-square, W.*
1857	Tudor, Henry, Esq. 12, *Portland-place, W.*
1876	Tufnell, Wm., Esq. 6, *Eaton-square, S.W.; and Hatfield-place, Hatfield-Peveral.*
1864	Turnbull, George, Esq., C.E., F.R.A.S. *Rosehill, Abbots Langley, Herts.*
1873	Turner, Hon. George.
1874	Turner, H. G., Esq. Madras Civil Service. 14, *St. James's-square, S.W.*
1870	2980 Turner, Lieut.-General Henry Blois, Bomb. Eng. 131, *Harley-street, W.*
1874	Turner, Jos. Edward, Esq. 30, *King-street, Cheapside, E.C.*
1863	Turner, Thomas, Esq. 36, *Harley-street, W.*
1867	Tweedie, Captain Michael, R.A. 31, *Victoria-road, Charlton.*
1864	*Twentyman, A. C., Esq. *Castlecroft, near Wolverhampton.*
1863	Twentyman, William H., Esq. *Ravensworth, St. John's-wood-park, N.W.*
1849	Twiss, Sir Travers, D.C.L., F.R.S. 3, *Paper-buildings, Temple, E.C.*
1874	Twite, Charles, Esq. 5, *Victoria-street, S.W.; and Castle-house, St. Agnes, Scorrier, Cornwall.*
1858	Twyford, Captain A. W., 21st Hussars. *Governor, County Prison, Bury St. Edmunds, Suffolk.*
1865	Tyer, Edward, Esq., C.E., F.R.A.S. 15, *Old Jewry-chambers, E.C.*
1862	2990 *Tyler, George, Esq. 24, *Holloway-place, Holloway-road, N.*
1873	Tyler, W. James, Esq. 15, *Bromley-common, Kent.*
1859	Tytler, Colonel W. Fraser. *Aldourie, Inverness.*
1876	Ullyett, Henry, Esq. *Dover-road, Folkestone.*
1869	Underdown, E. M. Esq., 3, *King's-Bench-walk, Temple, E.C.*
1862	Underhill, Edward Bean, Esq., LL.D. *Derwent-lodge, Thurlow-road, Hampstead, N.W.*
1868	Unwin, Howard, Esq., C.E. *Oxford-court,* 109A, *Cannon-street, E.C.*
1861	Usher, John, Esq. *Arthur's Club, St. James's-street, S.W.*

Year of Election.

1877 *Vacher, E. P., Esq. *Oak-hill, Surbiton.*

1844 *Vacher, George, Esq. *Oak-hill, Surbiton.*

1874 3000 Valentine, William J., Esq. *Homedale-house, Gypsy-hill, Upper Norwood; and* 18, *Cornhill, E.C.*

1872 *Vallentin, James R., Esq. 55, *Cow-cross, E.C.*

1862 *Vander Byl, P. G., Esq. 126, *Harley-street, W.*

1865 Vane, G., Esq. *Ceylon. Messrs. Price and Boustead, Craven-st., Strand, W.C.*

1876 Vanrenen, Lieut.-Col. Adrian Deneys, Bengal Staff Corps. 40, *Clarendon-road, Notting-hill, W.*

1875 Vans-Agnew, Robert, Esq., M.P. 44, *St. James's-place, S.W.*

1856 *Vaughan, James, Esq., F.R.C.S. *Builth, Breconshire.*

1852 *Vavasour, Sir Henry M., Bart. 8, *Upper Grosvenor-street, W.*

1855 Vavasseur, James, Esq. *Knockholt, near Sevenoaks, Kent.*

1871 Vereker, Lieut.-Col. the Hon. Chas. Smyth. *Junior United Service Club, S.W.*

1863 3010 *Vereker, The Hon. H. P., LL.D., H.M. Consul at Charante. 1, *Portman-square, W.*

1862 Verner, Edward Wingfield, Esq., M.P. *The Aske, Bray, Ireland.*

1862 *Verney, Commr. Edmond H., R.N. *Rhianva, Bangor, North Wales.*

1837 *Verney, Sir Harry C., Bart., F.R.A.S. *Travellers' Club, S.W.; and Claydon-house, Bucks.*

1852 Verulam, James Walter, Earl of. *Gorhambury, near St. Alban's; Barry-hill, Surrey; and Messing-hall, Essex.*

1874 *Vincent, Capt. Chas. (late I.N.). 56, *Lancaster-road, Notting-hill, W.*

1857 Vincent, John, Esq. 2, *Ulster-terrace, Regent's-park, N.W.*

1865 *Vincent, M. C., Esq., Professor of Economic Geology and Metallurgy; Inspector of Mines, &c. *Cincinnati, U.S.; and* 127, *Strand, London.*

1871 Vine, Staff-Comm. Wm. W., R.N. *Care of Messrs. Hallett and Co., St. Martin's-place, W.*

1858 Vines, William Reynolds, Esq., F.R.A.S. *Care of Sydney H. Vines, Esq., Christ's College, Cambridge.*

1874 3020 Viney, Rev. Josiah. *Fernwood, Highgate, N.*

1872 Vivian, Hon. H. Crespigny. *Foreign-office, S.W.*

1863 Vivian, Major Quintus. 17, *Chesham-street, Belgrave-square, S.W.*

1876 Vivian, Capt. Ralph. 24, *Grosvenor-street, W.*

1876 Vyse, Griffin William, Esq. *Dehra Ghasee Khan, E.I.*

1863 *Vyvyan, Sir Richard Rawlinson, Bart., F.R.S. *Trelowarren, Cornwall.*

1863 Wade, R. B., Esq. 13, *Seymour-street, Portman-square, W.*

1863 Wade, Sir Thos. F., K.C.B., H.B.M. Minister Plenipotentiary, Envoy Extraordinary, and Superintendent of Trade. *Peking, China.*

1873 *Wagner, Henry, Esq., M.A. 16, *King-street, St. James's, S.W.*

Year of Election.	
1853	*Wagstaff, William Racster, Baron, M.D., M.A.
1876	3030 Wainwright, Chas. Jas., Esq. *Merion-house*, 162, *Highbury-new-park; and* 251, *High Holborn, W.C.*
1869	Waite, Charles, Esq., LL.D., Principal of St. John's College. *Weighton-road, South Penge-park, S.E.*
1867	*Waite, Rev. John.
1871	Wakley, Thos. Finsbury Septimus, Esq., C.E. *College-terrace, Guernsey.*
1874	Walburn, Edmund, Esq., M.A., Principal of Grosvenor College. 366, *Brixton-road, S.W.*
1876	Wale, Rev. Burlington B. 10, *Southbrook-road, Burnt Ash-lane, Lee, S.E.*
1873	*Walford, Lionel N., Esq. 66, *Lowndes-square, S.W.*
1874	Walkem, Hon. Geo. Anthony. *British Columbia. Care of G. M. Sproat, Esq.*, 4, *Lime-street-square, E.C.*
1870	*Walker, Albert, Esq. *Auckland Club, New Zealand. Care of L. C. Walker, Esq.*, 3, *Hartley-villas, Lansdowne-road, Croydon.*
1875	Walker, Capt. Arthur Campbell (Royal Body Guard). *Army and Navy Club, Pall-mall.*
1862	3040 Walker, Major-General C. P. Beauchamp, C.B. 2, *Cranley-place, Onslow-square, S.W.; and United Service Club, S.W.*
1872	Walker, Capt. Campbell, Madras Staff Corps. *The Lawn, Esher.*
1861	Walker, Edward Henry, Esq., H.M. Consul at Cagliari. *Care of Messrs. Drummond, Charing-cross.*
1863	*Walker, Frederick John, Esq. *The Priory, Bathwick, Bath.*
1859	*Walker, Colonel James T., F.R.S., Royal Engineers. Supt. Gt. Trig. Survey of India. *Dehra Doon, India. Care of Messrs. H. S. King and Co.*, 65, *Cornhill, E.C.*
1873	Walker, John, Esq. 15, *Loughborough-road, North Brixton.*
1861	*Walker, John, Esq.
1858	*Walker, Captain John, H.M.'s 66th Foot. *Broom-hill, Colchester.*
1871	*Walker, Capt. J. B. *East Bank, Oxton, Birkenhead; and Old Calabar, near Bonny, West Africa.*
1864	Walker, R. B. N., Esq. *Care of Mr. Blissett*, 38, *South Castle-street, Liverpool.*
1874	3050 Walker, Robert, Esq. 15, *Clement's-inn, W.C.*
1863	*Walker, T. F. W., Esq. 6, *Brock-street, Bath; and Athenæum Club, S.W.*
1874	Walker, W. Fredk., Esq. *Moore-park-villas, Walham-green, S.W.*
1861	Walker, Rev. William. *Grammar-school, Hanley-castle, Upton-on-Severn.*
1866	Walker, William, Esq., F.S.A. 48, *Hilldrop-road, Tufnell-park, N.*
1868	Walkinshaw, William, Esq. *Hartley-grange, Winchfield, Hants.*
1854	*Wallace, Alfred Russell, Esq. *Rosehill, Dorking.*
1816	Wallace, Rev. Charles Hill, M.A. 3, *Harley-place, Clifton, Bristol.*
1872	Waller, Edmund, Esq. *Hoe-street, Walthamstow.*
1864	Waller, Rev. Horace. *The Rectory, Twywell-by-Thrapston, Northamptonshire.*
1863	3060 Wallich, George C., Esq., M.D. *Terrace-house, St. George's-terrace, Herne-bay.*
1872	*Wallroth, Chas. Henry, Esq. *Woodclyffe, Chislehurst.*

Year of Election.	
1874	Walls, William, Esq. 2, *Belhaven-terrace, Glasgow.*
1876	Walpole, Lieut. Robert Horace, R.N. *Rainthorpe, near Norwich; and* 4, *Dean-street, Park-lane, W.*
1863	Walpole, Rt. Hon. Spencer, M.P., F.R.S. 109, *Eaton-square, S.W.*
1875	Walshe, Capt. H. H. Hutchinson. *Singapore. Care of Thos. Pilkington, Esq.,* J.P., *Waterpark, Ennis, Ireland.*
1853	Walter, Henry Fraser, Esq. *Papplewick-hall, near Nottingham.*
1873	*Waltham, Edward, Esq. *Watcombe-house, Stockwell-green, S.W.*
1863	Walton, J. W., Esq. 41, *Great Marlbbrough-street, W.*
1864	Walton, R. G., Esq., C.E. *Bombay.*
1876	3070 *Ward, Christopher, Esq. *Saville-place, Halifax.*
1874	Ward, Edwin, Esq., F.Z.S. 49, *Wigmore-street, W.*
1853	*Ward, George, Esq.
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1869	Ward, William Robert, Esq. *Capesthorne-on-Avon, Christchurch.*
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1876		Watson, Jno. Gibson, Esq. 20, *Clanricarde-gardens, Hyde-park, W.*
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1862		*Webb, William Frederick, Esq. *Newstead Abbey, Notts; and Army and Navy Club, S.W.*
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MUNICH . . . . Bibliothèque Centrale Militaire
—— Geographical Society of
—— . . . . Royal Library
PARIS . . . . . Institut National
—— . . . . . Académie des Sciences
—— . . . . . Annales de l'Agriculture et des Régions Tropicales (Madinier, M.)
—— . . . . . Bibliothèque Nationale
—— . . . . . Dépôt de la Guerre
—— . . . . . Dépôt de la Marine
—— . . . . . Ministère de la Marine et des Colonies
—— . . . . . Société Asiatique
—— . . . . . Société d'Ethnographie
*PARIS . . . . . Société d'Encouragement pour l'Industrie Nationale
—— . . . . Société de Géographie
PESTH . . . . . Hungarian Academy of Sciences
*PRAGUE . . . . Bohemian Royal Museum
ROME . . . . . . Accademia dei Lincei
—— . . . . . Italian Geographical Soc.
—— . . . . Ministry of Public Instruction
—— . . . . . National Library of
ST. PETERSBURG Imperial Academy of Sciences
—— . Imperial Geographical Society
STOCKHOLM . . Bureau de la Recherche Géologique de la Suède
—— . . Royal Academy of Sciences
STRASBURG . . . Municipal Library
—— . . . Société des Sciences Naturelles
TUBINGEN . . . University Library
*UTRECHT . . . Royal Dutch Meteorological Institute
VENICE . . . . . Armenian Convent Lib.
VIENNA . . . . Imperial Academy of Sciences
—— . . . . Imperial Geographical Society
—— . . . . Imperial Geological Institute
—— . . . . . Meteorological Society
ZURICH . . . . . Society of Antiquaries
—— . . . . . Society of Naturalists

ASIA.

CALCUTTA . . . Asiatic Society of Bengal
—— . . . Geological Survey of India
—— . . . Public Library
DEHRA DHOON . Great Trigonometrical Survey of India, Library of
JAPAN . . . . . Asiatic Society
KURRACHEE . . General Library and Museum
MADRAS . . . . Literary and Philosoph. Society
SHANGHAI . . . Royal Asiatic Society (North China Branch)
SINGAPORE . . . Journal of Indian Archipelago

AFRICA.

CAIRO . . . . . Société Khédiviale de Géographie
CAPE TOWN . . The Public Library

AMERICA.

ALBANY . . . . New York State Library
BOSTON . . . . American Society of Arts and Sciences
—— . . . . . Massachusetts State Library
—— . . . . . Public Library
—— . . . . . Society of Nat. History
BRAZIL . . . . Historical and Geographical Institute of
CALIFORNIA . . Academy of Sciences
CHICAGO . . . . The New Library
CHILE . . . . . University of
MEXICO . . . . Geographical and Statistical Society of
NEW HAVEN . . Yale College Library
*—— . . Silliman's Journal

AMERICA—*continued.*

New York . . Geographical Society (Cooper's Institute)
Philadelphia, Academy of Natural Sciences
———, American Philosophical Society
———, Franklin Institute
Quebec . . . . Library of the Parliament of Canada
Salem . . . . . . Peabody Academy of Sciences
——— . . . . The 'American Naturalist'
San Francisco, Mercantile Lib. Association
St. Louis, Missouri, Academy of Sciences of
Texas . . . . . Soule University
*Toronto . . . Department of Public Instruction for Upper Canada
———, Canadian Institute of
Washington . . Congress Library of
——— . Smithsonian Institution
——— . U.S. Naval Observatory
——— . United States Geological Survey of the Territories
Worcester . . Antiquarian Society

AUSTRALASIA.

Adelaide . . Library of the Legislature
——— . . South Australian Institute
Melbourne . Public Library
*——— . Mining Department
Sydney . . . . University Library
Tasmania . . . Royal Society
——— . . . Public Library
*Victoria . . . Royal Society

New Zealand . Library of the House of Representatives

NAMES OF INDIVIDUALS

TO WHOM

THE ROYAL PREMIUMS AND OTHER TESTIMONIALS HAVE BEEN AWARDED.

1832.—**Mr. Richard Lander**—Royal Medal—for the discovery of the course of the River Niger or Quorra, and its outlet in the Gulf of Benin.

1833.—**Mr. John Biscoe**—Royal Medal—for the discovery of the land now named "Enderby Land" and "Graham Land," in the Antarctic Ocean.

1834.—**Captain Sir John Ross**, R.N.—Royal Medal—for discovery in the Arctic Regions of America.

1835.—**Sir Alexander Burnes**—Royal Medal—for the navigation of the River Indus, and a journey by Balkh and Bokhara across Central Asia.

1836.—**Captain Sir George Back**, R.N.—Royal Medal—for the discovery of the Great Fish River, and its navigation to the sea on the Arctic Coast of America.

1837.—**Captain Robert FitzRoy**, R.N.—Royal Medal—for the survey of the Shores of Patagonia, Chile, and Peru.

1838.—**Colonel Chesney**, R.A.—Royal Medal—for the general conduct of the "Euphrates Expedition" in 1835-6, and for accessions to the geography of Syria, Mesopotamia, and the Delta of Susiana.

1839.—**Mr. Thomas Simpson**—Founder's Medal—for the discovery and tracing, in 1837 and 1838, of about 300 miles of the Arctic shores of America.

Dr. Edward Rüppell—Patron's Medal—for his travels and researches in Nubia, Kordofán, Arabia, and Abyssinia.

1840.—**Col. H. C. Rawlinson**, E.I.C.—Founder's Medal—for his travels and researches in Susiana and Persian Kurdistán, and for the light thrown by him on the comparative geography of Western Asia.

Sir R. H. Schomburgk—Patron's Medal—for his travels and researches during the years 1835-9 in the colony of British Guayana, and in the adjacent parts of South America.

1841.—**Lieut. Raper**, R.N.—Founder's Medal—for the publication of his work on 'Navigation and Nautical Astronomy.'

Lieut. John Wood, I.N.—Patron's Medal—for his survey of the Indus, and re-discovery of the source of the River Oxus.

1842.—**Captain Sir James Clark Ross**, R.N.—Founder's Medal—for his discoveries in the Antarctic Ocean.

Rev. Dr. E. Robinson, of New York—Patron's Medal—for his work entitled 'Biblical Researches in Palestine.'

1843.—**Mr. Edward John Eyre**—Founder's Medal—for his explorations in Australia.

Lieut. J. F. A. Symonds, R.E.—Patron's Medal—for his survey in Palestine, and levels across the country to the Dead Sea.

1844.—**Mr. W. J. Hamilton**—Founder's Medal—for his researches in Asia Minor.

Prof. Adolph Erman—Patron's Medal—for his extensive geographical labours.

1845.—**Dr. Beke**—Founder's Medal—for his extensive explorations in Abyssinia.

M. Charles Ritter—Patron's Medal—for his important geographical works.

1846.—**Count P. E. de Strzelecki**—Founder's Medal—for his explorations and discoveries in the South-Eastern portion of Australia, and in Van Diemen's Land.

Prof. A. Th. Middendorff—Patron's Medal—for his extensive explorations and discoveries in Northern and Eastern Siberia.

1847.—**Capt. Charles Sturt**—Founder's Medal—for his various and extensive explorations in Australia.

Dr. Ludwig Leichhardt—Patron's Medal—for a journey performed from Moreton Bay to Port Essington.

1848.—**Sir James Brooke,** Rajah of Sarâwak and Governor of Labuan—Founder's Medal—for his expedition to Borneo.

Captain Charles Wilkes, U.S.N.—Patron's Medal—for his Voyage of Discovery in the S. Hemisphere and in the Antarctic Regions, in the years 1838–42.

1849.—**Austen H. Layard,** Esq., D.C.L. M.P.—Founder's Medal—for his contributions to Asiatic geography, researches in Mesopotamia, and discoveries of the remains of Nineveh.

Baron Ch. Hügel—Patron's Medal—for his explorations of Cashmere and surrounding countries, communicated in his work entitled 'Kashmir und das Reich der Siek.'

1850.—**Col. John Ch. Frémont**—Patron's Medal—for his successful explorations of the Rocky Mountains and California; and for his numerous Discoveries and Astronomical Observations.

The Rev. David Livingstone, of Kolobeng—a Chronometer Watch—for his successful explorations of South Africa.

1851.— Dr. George Wallin, of Finland—25 Guineas—for his Travels in Arabia.

Mr. Thomas Brunner—25 Guineas—for his explorations in the Middle Island of New Zealand.

1852.—**Dr. John Rae**—Founder's Medal—for his survey of Boothia and of the Coasts of Wollaston and Victoria Lands.

Captain Henry Strachey—Patron's Medal—for his Surveys in Western Tibet.

1853.—**Mr. Francis Galton**—Founder's Medal—for his explorations in Southern Africa.

Commander E. A. Inglefield, R.N.—Patron's Medal—for his Survey of the Coasts of Baffin Bay, Smith and Lancaster Sounds.

1854.—**Rear-Admiral William Henry Smyth**—Founder's Medal—for his valuable Surveys in the Mediterranean.

Captain Robert J. M. M'Clure, R.N.—Patron's Medal—for his discovery of the North-West Passage.

1855.—**The Rev. David Livingstone,** M.D., &c.—Patron's Medal—for his Scientific Explorations in Central Africa.

Mr. Charles J. Andersson—a Set of Surveying Instruments—for his Travels in South-Western Africa.

1856.—**Elisha Kent Kane**, M.D.—Founder's Medal—for his discoveries in the Polar Regions.

Heinrich Barth, PHIL. DR.—Patron's Medal—for his explorations in Central Africa.

Corporal J. F. CHURCH, of the Royal Engineers—a Watch and Chain—for his scientific observations while attached to the Mission in Central Africa.

1857.—**Mr. Augustus C. Gregory**—Founder's Medal—for his explorations in Western and Northern Australia.

Lieut.-Col. Andrew Scott Waugh, Bengal Engineers—Patron's Medal—for the Great Trigonometrical Survey of India.

1858.—**Captain Richard Collinson**, R.N.—Founder's Medal—for his Discoveries in the Arctic Regions.

1858.—**Prof. Alexander Dallas Bache**, Superintendent U. S. Coast Survey—Patron's Medal—for his extensive Surveys of America.

1859.—**Captain Richard F. Burton**—Founder's Medal—for his Explorations in Eastern Central Africa.

Captain John Palliser—Patron's Medal—for his explorations in British North America and the Rocky Mountains.

Mr. JOHN MACDOUALL STUART—a Gold Watch—for his Discoveries in South and Central Australia.

1860.—**Lady Franklin**—Founder's Medal—in commemoration of the discoveries of Sir J. Franklin.

Captain Sir F. Leopold McClintock, R.N.—Patron's Medal—for his Discoveries in the Arctic Regions.

1861.—**Captain John Hanning Speke**—Founder's Medal—for the Discovery of the Great Lake Victoria Nyanza, Eastern Africa, &c.

Mr. John Macdouall Stuart—Patron's Medal—for his Explorations in the Interior of Australia.

1862.—**Mr. Robert O'Hara Burke**—Founder's Medal—for his Explorations in Australia.

Captain Thomas Blakiston—Patron's Medal—for his survey of the River Yang-tsze-kiang.

Mr. JOHN KING—a Gold Watch—for his meritorious conduct while attached to the Expedition under Mr. R. O'Hara Burke.

1863.—**Mr. Frank T. Gregory**—Founder's Medal—for his explorations in Western Australia.

Mr. John Arrowsmith—Patron's Medal—for the very important services he has rendered to Geographical Science.

Mr. WILLIAM LANDSBOROUGH—a Gold Watch—for successful Explorations in Australia.

Mr. JOHN M'KINLAY—a Gold Watch—for successful Explorations in Australia.

Mr. FREDERICK WALKER—a Gold Watch—for successful Explorations in Australia.

1864.—**Captain J. A. Grant**—Patron's Medal—for his journey from Zanzibar across Eastern Equatorial Africa to Egypt, in company with Captain Speke.

Baron C. von der Decken—Founder's Medal—for his two Geographical Surveys of the lofty Mountains of Kilima-njaro.

Rev. W. GIFFORD PALGRAVE—the sum of 25 Guineas—for the purchase of a Chronometer or other Testimonial, for his adventurous Journey in and across Arabia.

1865.—**Captain F. G. Montgomerie**, R.E.—Founder's Medal—for his Trigonometrical Survey of North-West India.

Mr. S. W. Baker—Patron's Medal—for his relief of Capts. Speke

and Grant, and his endeavour to complete the discoveries of those travellers.

Dr. A. Vámbéry—the sum of 40 Pounds—for his Travels in Central Asia.

1866.—**Dr. Thomas Thomson,** M.D.—Founder's Medal—for his Researches in the Western Himalayas and Thibet.

Mr. W. Chandless—Patron's Medal—for his Survey of the River Purûs.

M. P. B. du Chaillu—the sum of 100 Guineas—for his Astronomical Observations in the Interior of Western Equatorial Africa.

Moola Abdul Medjid—a Gold Watch—for his Explorations over the Pamir Steppe, &c.

1867.—**Admiral Alexis Boutakoff**—Founder's Medal—for being the first to launch and navigate ships in the Sea of Aral.

Dr. Isaac I. Hayes—Patron's Medal—for his memorable expedition in 1860-61 towards the open Polar Sea.

1868.—**Dr. Augustus Petermann**—Founder's Medal—for his zealous and enlightened services as a writer and cartographer in advancing Geographical Science.

Mr. Gerhard Rohlfs—Patron's Medal—for his extensive and important travels in the interior of Northern Africa.

The Pundit employed by Captain T. G. Montgomerie—a Gold Watch—for his route survey from Lake Mansarowar to Lhasa, in Great Thibet.

Educational Prize:—

Mr. John Wilson—the sum of Five Pounds—for successful competition in Geography at the Society of Arts examination.

1869.—**Professor A. E. Nordenskiöld**—Founder's Medal—for the leading part he took in the recent Swedish Expeditions in the North Polar Region.

Mrs. Mary Somerville—Patron's Medal—in recognition of the able works published by her; which have largely benefited Geographical Science.

Schools' Prize Medals:—

Political Geography.—Hy. G. Richmond, Liverpool College (Gold Medal).
Jas. Dearden Wilde, Manchester Grammar School (Bronze Medal).

Physical Geography.—Wm. Grundy, Rossall School (Gold Medal).
Geo. Wm. Gent, Rossall School (Bronze Medal).

Educational Prize:—

Mr. John Kidney—the sum of Five Pounds—for successful competition in Geography at the Society of Arts examination.

1870.—**Lieutenant Fras. Garnier** (of the French Imperial Navy)—Patron's Medal—for his survey of the course of the great Cambodian River during the years 1866–8.

Mr. George W. Hayward—Founder's Medal—For his explorations in Eastern Turkistan.

Schools' Prize Medals:—

Political Geography.—Geo. Wm. Gent, Rossall School (Gold Medal).
Jas. Hy. Collins, Liverpool College (Bronze Medal).

Physical Geography.—Geo. Grey Butler, Liverpool College (Gold Medal).
Martin Stewart, Rossall School (Bronze Medal).

Educational Prize:—

Mr. Thomas Richard Clarke—the sum of Five Pounds—for successful competition in Geography at the Society of Arts examination.

1871.—**Sir Roderick I. Murchison,** Bart.—Founder's Medal—in

recognition of the eminent services he has rendered to Geography during his long connection with the Society.

A. Keith Johnston, LL.D. — Patron's Medal — for his long-continued and successful services in advancing Geography, and especially for his merit in carrying out his scheme of Physical Atlases.

SCHOOLS' PRIZE MEDALS:—

Political Geography.—GEO. HOGBEN, University School, Nottingham (Gold Medal).

RICHD. NAYLOR ARKLE, Liverpool College (Bronze Medal).

Physical Geography.—DANIEL MCALISTER, Liverpool Institute (Gold Medal).

WM. GERSHOM COLLINGWOOD, Liverpool College (Bronze Medal).

EDUCATIONAL PRIZE:—

Mr. JOHN ARMSTRONG—the sum of Five Pounds—for successful competition in Geography at the Society of Arts examination.

1872.—**Colonel Henry Yule**, C.B.—Founder's Medal—for the eminent services he has rendered to Geography in the publication of his three great works, 'A Mission to the Court of Ava,' 'Cathay, and the Way Thither,' and 'Marco Polo.'

Mr. Robert Berkeley Shaw—Patron's Medal—for his Journeys in Eastern Turkistan, and for his extensive series of Astronomical and Hypsometrical Observations, which have enabled us to fix the longitude of Yarkand, and have given us, for the first time, the basis of a new delineation of the countries between Leh and Kashgar.

Lieut. G. C. MUSTERS, R.N.—a Gold Watch—for his adventurous Journey in Patagonia, through 960 miles of latitude, of which 780 were previously unknown to Europeans.

KARL MAUCH—the sum of Twenty-five Pounds in acknowledgment of the zeal and ability with which he has devoted himself, for a series of years, to the Exploration of South-Eastern Africa.

SCHOOLS' PRIZE MEDALS:—

Physical Geography.—S. E. SPRING RICE, Eton College (Gold Medal).

A. S. BUTLER, Liverpool College (Bronze Medal).

Political Geography.—W. G. COLLINGWOOD, Liverpool College (Gold Medal).

W. C. GRAHAM, Eton College (Bronze Medal).

EDUCATIONAL PRIZE:—

Mr. GEO. M. THOMAS—the sum of Five Pounds—for successful competition in Geography at the Society of Arts Examination.

1873.—**Mr. Ney Elias**—Founder's Medal—for his survey of the Yellow River of China, in 1868; and for his recent journey through Western Mongolia.

Mr. H. M. Stanley—Patron's Medal—for his discovery and relief of Dr. Livingstone.

Mr. THOMAS BAINES—a Gold Watch—for his long-continued services to Geography, and especially for his journeys in South-Western and South-Eastern Africa.

Captain CARLSEN—a Gold Watch—for his discoveries in the Arctic Seas, and for having circumnavigated the Spitzbergen as well as the Nova Zembla groups.

SCHOOLS' PRIZE MEDALS:—

Physical Geography.—W. C. HUDSON, Liverpool College (Gold Medal).

W. A. FORBES, Winchester College (Bronze Medal).

Political Geography.—S. E. SPRING RICE, Eton College (Gold Medal).

A. T. NUTT, University College School (Bronze Medal).

1874.—**Dr. Georg Schweinfurth**—Founder's Medal—for his discovery of the Uelle River, beyond the South-western limits of the Nile basin; and for his admirable work, 'The Heart of Africa,' in which he has recorded the results of his travels.

Colonel P. Egerton Warburton—Patron's Medal—for his journey across the previously unknown Western Interior of Australia; from Alice Springs, on the line of overland telegraph, to the West Coast near De Grey River.

SCHOOLS' PRIZE MEDALS:—

Physical Geography.—LOUIS WESTON, City of London School (Gold Medal).

FRANCIS CHARLES MONTAGUE, University College School (Bronze Medal).

Political Geography.—WILLIAM HARRY TURTON, Clifton College, Bristol (Gold Medal).

LIONEL JACOB, City of London School (Bronze Medal).

1875.—**Lieut. Weyprecht**—Founder's Medal—for his explorations and discoveries in the Arctic Sea between Spitzbergen and Nova Zembla.

Lieut. Julius Payer—Patron's Medal—for his journey and discoveries along the coast of Franz-Josef's Land, between Spitzbergen and Nova Zembla.

W. H. JOHNSON—Gold Watch—for services rendered to Geography while engaged in the Great Trigonometrical Survey of India among the Himalayas.

SCHOOLS' PRIZE MEDALS:—

Physical Geography.—HENRY ALLXANDER MIERS, Eton College (Gold Medal).

ARCHIBALD EDWARD GARROD, Marlborough College (Bronze Medal).

Political Geography.—SIDNEY H. B. SAUNDERS, Dulwich College (Gold Medal).

WM. C. GRAHAM, Eton College (Bronze Medal).

1876.—**Lieut. V. Lovett Cameron**, R.N.—Founder's Medal—for his journey across Africa from Zanzibar to Benguela, and his survey of the Southern half of Lake Tanganyika.

Mr. John Forrest—Patron's Medal—in recognition of the services to Geographical Science rendered by his numerous successful explorations in Western Australia, and especially for his admirably executed route-survey across the interior from Murchison River to the line of Overland Electric Telegraph.

SCHOOLS' PRIZE MEDALS:—

Physical Geography.—JOHN WILKIE, Liverpool College (Gold Medal).

WALTER NEW, Dulwich College (Bronze Medal).

Political Geography.—THOMAS KNOX, Haileybury College (Gold Medal).

W. M. H. MILNER, Marlborough College (Bronze Medal).

CAMBRIDGE LOCAL EXAMINATIONS PRIZE MEDAL:—

F. H. GLANVILL, Devon County School (Silver Medal).

OXFORD LOCAL EXAMINATION PRIZE MEDALS:—

JOHN WILKIE, Liverpool College (Silver Medal).

H. M. WARD, Bridgnorth Grammar School (Bronze Medal).

PRESENTATION

OF THE

ROYAL AND OTHER AWARDS.

(*At the Anniversary Meeting, May 22nd,* 1876.)

ROYAL MEDALS.

THE FOUNDER'S MEDAL for the year 1876 was awarded by the Council to Lieutenant V. L. Cameron, R.N., for his journey across Africa from Zanzibar to Benguela, and his survey of the southern half of Lake Tanganyika; the VICTORIA, or PATRON'S MEDAL, to Mr. John Forrest, in recognition of the services to Geographical Science rendered by his numerous successful explorations in Western Australia, and especially for his admirably executed route-survey across the interior from Murchison River to the line of Overland Electric Telegraph.

Lieutenant Cameron attended in person to receive his Medal. Mr. Forrest's, in his absence, was received by J. Lowther, Esq. M.P., Her Majesty's Under Secretary of State for the Colonies.

In addressing Lieutenant Cameron, the PRESIDENT said:—

"MR. CAMERON,

"I have been requested by my colleagues of the Geographical Council to present you with 'the Founder's Medal of this year for 'the encouragement of Geographical Science and Discovery, which 'has been awarded to you for your journey across Africa from Zan- 'zibar to Benguela, and for your Survey of the Southern half of 'Lake Tanganyika;' and I fulfil this duty with all the more pleasure and satisfaction that I was in the Chair when we sent you forth on your honourable and important Mission, and have thus had the opportunity of watching your progress, step by step, through the many trials and triumphs of your memorable journey. As English-

men we are proud that the great feat of traversing Equatorial Africa from sea to sea should have been accomplished for the first time by an Officer in the Naval Service of the Queen; but we wish it to be understood that it is not your success in this particular exploit, it is not your remarkable exhibition of manly courage and perseverance — though these qualities, which you possess in an eminent degree, will always secure you the full and well-merited admiration of your countrymen — which have on this occasion exclusively, or even in an especial degree, recommended you to the favourable notice of the Council. We have selected you to be our Medallist, above all other reasons, because you have, amidst difficulties and dangers, in failing health, under privation and fatigue, steadily kept in view the paramount claim on your attention of Scientific Geography, and have thus brought back with you from the interior of Africa a Register of Observations for Latitude, Longitude, and Elevation, which, for extent and variety—and we are authorised by the Report of the Greenwich authorities to add for judicious selection and accuracy of result—may favourably compare with the finished work of a professional Survey. We feel, therefore, that we may fairly hold you up as a model to future travellers, trusting, indeed, that Geographical Science may as largely profit by the example which you have set to others, as by the results which you have yourself contributed. Sir, you have already received at the hands of your Sovereign, as a reward for your brilliant achievement, the distinction of the Companionship of the Bath, which I believe was never before bestowed on so young an officer in Her Majesty's Naval Service. You are also daily receiving proofs of the interest that your discoveries have excited among the public at large, owing to the practical benefits which the nation may expect to derive from them, both in regard to its commerce, and especially in regard to that object it has so much at heart—the suppression of the African Slave-trade; and I am now to offer you, in the name of Geographical Science, the highest honour we can confer—the Founder's Medal of the year.

"And in congratulating you on thus taking your place on the Golden roll of the Geographical Society's Medallists, I may be permitted to add that, having presided on five occasions at the distribution of our Annual Awards, it has never been my fortune to present the Medal to one who, by his services, has more thoroughly earned it."

Lieutenant CAMERON replied as follows:—

"Sir Henry Rawlinson, I beg to thank you most heartily for the Medal. It has been the one great hope that has sustained me through my recent Expedition. I knew very well when I was in Africa that I was not there to play, but to take observations for mapping out the country, and the training I had received in the service to which I am proud to belong taught me how to do it. I am glad to find that my observations have been appreciated, and that they are found to be accurate and good. I beg to thank you most cordially for this testimony of your approval of my labours."

Turning to Mr. Lowther, the PRESIDENT spoke as follows:—

"SIR,—Knowing the interest which you take from your official position in everything affecting the reputation and prosperity of our Colonial Empire, I am particularly glad to be permitted on this occasion to deliver into your hands, for transmission to Australia, the Patron's Medal of the Royal Geographical Society for the present year, which has been awarded by the Council to a most meritorious traveller, Mr. J. Forrest, 'in recognition of the services to Geographical Science rendered by his numerous successful explorations in Western Australia, and especially for his admirably-executed route-survey across the interior from Murchison River to the line of the Overland Electric Telegraph.' Already on eight different occasions the Council of our Society, on weighing the claims of travellers in all parts of the world, has awarded the great prize of the year to Australian explorers—the enormous tracts of uninhabited, and for the most part unknown, territory in the interior of the Australian Continent, and the difficulty of transit from one point to another, owing to the waterless character of the intervening country, giving a certain grandeur and importance to Australian discovery, over and above the material benefit to be derived from acquiring fresh lands for settlement, which is wanting in other regions. Never, however, since Macdouall Stuart, in 1860, traversed Australia from south to north and explored the route on which the line of the Electric Telegraph was subsequently laid, has a journey been undertaken of the same magnitude and difficulty as that recently accomplished by Mr. John Forrest and his party between Champion Bay, on the west coast, and the Peake Station, on the line of the Overland Telegraph; and never certainly, either in Australia or in any other country, has a more conscientious and exhaustive survey been executed of the route traversed in so long

and arduous a journey. It appears that the total distance which the party travelled, for the most part on foot, was about 2000 miles, the road lying for some 600 miles through a region covered with *Mulga* jungle and spinifex grass, and almost destitute of water; and the result of their experience being that the country was entirely unfitted for settlement. In testimony of our admiration of the untiring energy and perseverance which enabled Mr. Forrest to traverse successfully this desolate and arid tract, and thus acquire for his Government a knowledge of the true character of the country, as well as in grateful acknowledgment of his services rendered to Scientific Geography, both in his previous exploration round the shores of the great Australian Bight and in his present most excellent Survey and Report, we adjudge to him the Patron's Medal of the year; and in placing the Medal in your hands, we venture to add that it will greatly enhance the value of the award if you will undertake to transmit our offering to its destination through the Australian authorities."

Mr. Lowther, in reply, said he was sure he was justified in returning Mr. Forrest's hearty thanks for the honour that had been conferred upon him. His noble friend, Lord Carnarvon, would have had great pleasure in attending had he not been unavoidably detained; but even if his Lordship had been present he would not have been the real "lion;" that honour belonged to the absent traveller. He wished, however, to express the great gratification which he experienced in accepting, on behalf of a colonist of one of the most important dependencies of the Crown, this appreciation of his services. It must be patent to all that no greater tie could unite the mother country to her colonies than the conviction among the colonists that their fortunes, their successes, and in some cases even their disappointments, were anxiously watched by those who owned them as their fellow-countrymen. Mr. Forrest had performed a feat which not only involved considerable physical and moral courage, but which, it might be sincerely hoped, would be of lasting service to the cause of mankind. His travels had not been pursued merely for pleasure or the greed of gain, but they had been undertaken on public grounds, at the call of the public authorities in the interests of the community. Lieutenant Cameron had been complimented on the accuracy with which, throughout all the difficulties which he had had to encounter, he had maintained his records; and in Mr. Forrest's case no small portion of the gratitude which he had so

deservedly earned was owing to the very great accuracy with which, under circumstances of extreme difficulty and danger, he had continued to make his observations, thus adding a very important chapter to scientific geography. He thanked the Society for their beautiful gift, and it would afford him great pleasure to forward it to Mr. Forrest.

PUBLIC SCHOOLS' PRIZE MEDALS.

The following was the award of the Examiners of the present year:—

Physical Geography. *Gold Medal.*—John Wilkie, Liverpool College. *Bronze Medal.*—Walter New, Dulwich College. *Honourably Mentioned.*—J. A. Robinson, Liverpool College; L. P. Jacks, University School, Nottingham; E. von Lengeske, Haileybury College; Sir Malby Crofton, Eton College; F. S. Carey, Bristol Grammar School.

Political Geography. *Gold Medal.*—Thomas Knox, Haileybury College. *Bronze Medal.*—W. M. H. Milner, Marlborough College. *Honourably Mentioned.*—J. B. Johnston, Edinburgh High School; H. W. Pigeon, Clifton College; J. F. Heyes, Liverpool College; W. J. Newton, Liverpool College; (equal) A. R. Ropes, City of London School, and W. MacMaster, Rathmines School, Dublin.

Oxford and Cambridge Local Examinations Prize Medals.—Under arrangement with the Universities of Oxford and Cambridge for the award of Medals to the best Senior candidates in Geography, whether male or female, in their Local Examinations, a *Silver Medal* has this year been awarded, by Cambridge, to F. H. Glanvill, Devon County School. This single award was made, as a commencement, on the result of the Examinations held by the Cambridge Delegates in December, 1875. In 1876, and future years, two Silver Medals will be offered by the Society for award by Cambridge, viz.: one each for the best candidate selected by the Delegates in the two branches of Physical and General Geography. For Oxford the arrangement will be somewhat different: one Silver and one Bronze Medal being promised, to the best and second best candidate in General Geography.

Mr. Francis Galton stated that twenty schools had sent candidates for the Public Schools' Prize Medals this year, there being

59 competitors in all. During the past eight years 32 Medals had been given. Out of those, Liverpool College had gained 9, Eton 5, Rossall 4, University College School 3, City of London School 2, Dulwich College 2, and seven others one each. Those who were boys when these Medals were first instituted were now growing into manhood; they had passed or were passing their University careers with credit, and might now be looked to to fulfil what was one of the primary objects for which the Medals were established, namely, the advancement of Geographical science, either as writers or professors, or conductors of examinations. He, therefore, mentioned with much pleasure that one of the earliest Gold Medallists, Mr. G. G. Butler, had just been appointed by the Civil Service Commissioners as one of their two permanent Examiners.

The PRESIDENT then presented the medals to the successful competitors.

The Hon. G. C. BRODRICK said there was ample reason to be satisfied with the results of the Geographical Examinations conducted by the Society. Considering how many examinations of various kinds boys were now subject to at the public schools, the number of candidates offering themselves for our geographical competitions was most encouraging. Success, however, was not merely to be measured by numbers, but also by the character of the schools which had competed. The various classes of public schools had been admirably represented in the thirteen which had been successful in winning medals since these examinations commenced. The old public schools were worthily represented by Eton and Winchester; the new public schools by Marlborough, Haileybury, Clifton, and Rossall; the great metropolitan schools by the City of London School, University College School, and Dulwich College; and the great schools in the provincial capitals by Nottingham, Manchester Grammar School, Liverpool Institute, and, above all, by Liverpool College. Geographical education owed a great deal to Mr. Butler, the head master of the last-named, who was the very first to appreciate the importance of these prizes, and nearly twice as many of whose scholars had obtained medals as from any other school. Considering how great the success of the examinations had been, he was not surprised that some desire had been exhibited by those interested in female education, that girls should be admitted to the competition. At first there was a suggestion that separate prizes might be awarded to girls' schools, but that

plan met with very little favour, as it would have defeated one of the objects which the applicants had at heart—that girls should be fairly matched against boys—at least in Geography. The Council had no desire to prejudge this very delicate question, but they were not willing to risk the continued success of what was still only an experiment, by the introduction of a totally new element; and those girls' schools from which application had been received, were of a different type from those public schools which had hitherto been invited to compete. The Universities of Oxford and Cambridge had, however, consented to state the names of those who showed the greatest proficiency in geography at the Local Examinations, with a view to the Geographical Society awarding them prizes; and one candidate had already had a prize given to him under these circumstances. He would be very glad if one of the next successful competitors for these prizes should be a girl. The subject for the Public Schools' Examinations next year would be "Africa, South of the Equator." It had been felt that Africa, which had been so glorious a field of geographical discovery, ought to be somewhat more carefully studied than it had yet been by the boys of the public schools. It was true that it was rather a large subject for treatment, but it so happened that the geographical features of that vast continent were remarkably simple; and students would not need to trouble themselves very much with the political history of the interior. Last year, in selecting the Arctic Regions as the subject for examination, the Council had the great advantage arising from the public interest which had attached itself to the Expedition under Captain Nares. This year there was a similar advantage in the interest excited by Lieutenant Cameron's memorable journey; and if no other result was attained by these prizes, they would not be utterly useless if they led some of the most intelligent boys in the public schools to follow, with interest and sympathy, such expeditions as those of Captain Nares and Lieutenant Cameron, expeditions in which English gentlemen, who might have been lounging or dreaming away their lives at home, as so many do, had preferred to endure untold hardships, and to manifest the highest physical and moral courage, not for the sake of gain or pleasure, but from a pure love of discovery, and for the advancement of science and the honour of their country.

The Ballot for the New Council was then taken, and the result declared by the scrutineers to be as follows (the names in

Italics being those of the New Councillors, or those who change office):—

President: *Sir Rutherford Alcock*, K.C.B., &c. *Vice-Presidents*: *Major-General Sir Henry C. Rawlinson*, K.C.B.; *Right Hon. Sir H. Bartle Frere, Bart.*, K.C.B.; Right Hon. Lord Cottesloe; *Admiral Sir Alexander Milne*, K.C.B. *Trustees*: Lord Houghton, D.C.L., F.R.S.; Sir Walter C. Trevelyan, Bart. *Secretaries*: Clements R. Markham, Esq., C.B., F.R.S.; R. H. Major, Esq., F.S.A. *Foreign Secretary*: Lord Arthur Russell, M.P. *Councillors*: *Admiral Sir George Back*, K.C.B., D.C.L.; John Ball, Esq., F.R.S.; Sir T. Fowell Buxton, Bart.; *Hon. G. C. Brodrick*; Sir George Campbell, K.C.S.I., M.P.; Captain F. J. O. Evans, R.N., C.B.; *Sir Barrow Ellis*, K.C.S.I.; James Fergusson, Esq., F.R.S.; Major-General Sir Frederic J. Goldsmid, K.C.S.I.; Francis Galton, Esq., F.R.S.; *Captain Douglas Galton*, R.E., F.R.S.; *Colonel J. A. Grant*, C.B.; *Major-General Sir W. H. R. Green*, K.C.S.I.; Vice-Admiral Sir William H. Hall, K.C.B.; Admiral G. H. Richards, C.B., F.R.S.; General C. P. Rigby, ; *Sir Rawson W. Rawson*, K.C.M.G. C.B.; H. Danby Seymour, Esq.; General R. Strachey, F.R.S.; Sir Harry C. Verney, Bart.; *Colonel Henry Yule*, C.B. *Treasurer*: Reginald T. Cocks, Esq.

The PRESIDENT then proceeded to read his Annual Address on the progress of Geography.

The reading being terminated,

Lord COTTESLOE rose to propose a vote of thanks to Sir Henry Rawlinson for his address, with a request that he would allow it to be printed. All present, he said, must have been highly gratified by the amount of geographical information conveyed to them in so interesting a form. Though he had not been a member of the Society quite so many years as the President, he had seen it rise from very small beginnings to very large dimensions. The first meeting he attended was in a small drawing-room in Whitehall Place; but now upon special occasions even St. James's Hall was too small to accommodate all who desired to be present. He quite agreed with the President that the Society had given an impetus to geographical science and discovery, not only in this country but throughout Europe. He regretted the resignation of Sir Henry Rawlinson, who for five years had given great attention to the interests of the Society, and conducted its affairs with even as much zeal and success as the lamented Sir Roderick Murchison himself, whose equal he had never expected to find occupying the

chair. Mixed with his regret, however, there was the consolation of knowing that Sir Henry was to be succeeded by a gentleman of such distinguished ability as Sir Rutherford Alcock.

The resolution was unanimously agreed to.

Sir Rawson Rawson proposed a vote of thanks to the retiring Members of Council, the Committee, the Auditors, and the Scrutineers for the year.

Mr. George Peacock seconded the motion, and in doing so said every Englishman must feel proud that such a Society existed, and that it was so ably conducted for the benefit and instruction of the world.

The resolution was agreed to.

Sir Henry Rawlinson said the Fellows would no doubt excuse his making any lengthened speech after reading to them for two hours, but he was bound to say that his conduct of the affairs of the Society had been a labour of love and a source of great gratification to him. He could not help foreseeing that he should often regret that he did not still continue at his old post, but he would have the consolation of knowing that the work was being thoroughly well looked after by his friend Sir Rutherford Alcock. There could be no question that the work of the President, though onerous, was of the deepest interest, and any person who engaged in it would find that while it occupied more and more of his time, it day by day acquired fresh interest in his eyes and a hold upon his whole mind and attention. He had no doubt that though Sir Rutherford Alcock might find the details a little irksome at first, he would, when he got fairly into running, feel that it was really an exciting occupation. He himself could not say that he was taking leave of the Fellows, for he had still the honour of retaining a place among the vice-presidents, and he hoped to be just as regular in his attendance at the meetings as he had been during the time he had occupied the chair. His interest in the Society was not by any means diminished. He wished it every possible success in the future—as much as it had attained in the past.

ADDRESS

TO

THE ROYAL GEOGRAPHICAL SOCIETY.

Delivered at the Anniversary Meeting on the 22nd May, 1876.

By Major-General Sir H. C. Rawlinson, K.C.B., F.R.S., D.C.L., LL.D., etc., President.

Gentlemen,

The year which has elapsed since I had the honour of addressing you at the last Anniversary Meeting has been one of great importance to our Society, both in regard to our material prosperity and our scientific reputation. It has witnessed, on the one hand, our passage of that Rubicon of 3000 paying Members, which has often been assigned as the limit of our possible expansion. It has witnessed, on the other hand, the successful accomplishment of by far the most serious Geographical enterprise in which the Society has ever been yet engaged. The net increase of the past year has not equalled, it is true, the exceptionally large accession which was made to our ranks during the preceding twelvemonth—the increase during one period being 200, as against 150 during the other—but it has far exceeded the average annual augmentation of the last ten years, and it has moreover now fairly launched us into our fourth thousand of Ordinary or paying Fellows. The following brief statement of figures will speak more eloquently as to the flourishing condition of the Society than any description in words, however full. Our total numbers now amount to 3196, of whom 3125 are Ordinary, and 71 are Honorary Fellows. Our income during the year 1875 was very nearly 8000*l.* Our House and fixtures in Savile Row are valued at 20,000*l.*, our Library and Maps may be estimated at 6000*l.*, and we have about 10,000*l.* invested in public securities. But these figures, although abundantly proving our material prosperity, do not at all adequately represent our improved position in general

estimation. In my opening Address at the commencement of the Session I had occasion to notice the deference that was paid to our Society by the Geographers of Europe at the Paris International Congress of last autumn—a deference that was not due to our antiquity, for both the Berlin and Paris Societies are older institutions than our own, but which was paid to us "in regard to our numbers, our wealth, and our influence; and especially because, as the patrons of discovery and the guardians of the best interests of Geography, we were admitted to be at the head of this department of science." And certainly our career since the date of my Address has not been one of derogation from this high position, but has, on the contrary, augmented our reputation, and improved our means of future usefulness. The brilliant success, indeed, which has attended our deputation of Lieutenant Cameron to Africa, has drawn the attention of the whole civilised world to the magnitude and importance of our undertakings. It would be unworthy of this great Society to claim an exclusive credit, or even a preponderating share of credit, for the magnificent results of Lieutenant Cameron's journey. To the undaunted traveller himself, who, in his solitary camp on Lake Tanganyika, conceived the grand design of tracing the Lualaba to the sea, and who, in pursuance of that design, proceeded to force his way to the Western sea-coast in the face of all difficulties and dangers, and under the burden of a crushing personal responsibility, must be ascribed the chief honour of the enterprise; but it will always be our pride to remember that the Geographical Society, acting as Trustee for the public, enabled Lieutenant Cameron in the first instance to reach Lake Tanganyika with a due provision of equipment and supply; and that throughout his subsequent exploration, although undertaken without our expressed sanction, we have cheerfully met all his calls upon us for current and contingent expenditure. We believe it to be our vocation and our duty, as far as our means extend, thus to direct and encourage all enterprises for the advancement of Geographical knowledge; and when our means as a private Society are insufficient to cope with the heavy outlay incident on such undertakings, while, at the same time, as in the present case, the results obtained are of a national—almost of a world-wide—importance, we know that we may rely with confidence both on the aid of a generous public and the support of a discriminating Government.

I must refer to my November Address, which has already ap-

peared in our 'Proceedings,' for a Report on all those matters of current Geographical interest, both at home and abroad, which occurred during last summer and autumn. Our participation in the work of the Paris International Congress of Geographers, and of the subsequent Meeting of the British Association at Bristol, will be there found duly noticed, and it is needless therefore to repeat the record. I shall, accordingly, proceed at once to what is a painful, but, at the same time, a solemn and obligatory duty—a consideration of the losses which we have sustained during the past year from the death of so many of our most valued and most distinguished Associates.

OBITUARY.

Werner Munzinger, c.b.—Our late Honorary Corresponding Member, Werner Munzinger, was born on the 4th of April, 1832, at Olten, in the Canton of Solothurn, Switzerland. His father, Joseph Munzinger, previous to the year 1848, was magistrate in his Canton, and subsequent to that time was elected one of the seven Councillors of Switzerland, occupying a Chair in the Federal Council at Berne until 1855, the year of his death. The education of young Munzinger commenced at Soleure, in the Gymnasium of that city, and was completed at the University of Berne, in which his much-loved elder brother, Dr. Walter Munzinger, subsequently became Professor of Law. It was his father's desire that he should study medicine, but his ardent imagination, revelling in Oriental story and the narratives of great travellers, could not be brought down to so prosaic a pursuit, and he adopted for the time the study of philology. During the years 1850–1 Munzinger studied at the University of Munich, and, on his return home, went to Paris, and studied there Hebrew and the modern languages. His thoughts were now turned to the East, and he left Paris for Cairo, where he spent twelve months in the quiet study of the languages of the country. The exhaustion of his financial means then compelled him to take a situation in a French mercantile house, and having won the confidence of the principals, he was sent on business in one of their vessels to the various ports of the Red Sea. It was on this voyage that he first saw the little island of Massowa, which was afterwards to become his residence, and the centre of the most important events of his life. On the completion of his engagement with the French house, he returned to Massowa on his own affairs,

and as French Consul. His love of exploration led him soon to undertake various excursions in the interior, chiefly to Bogos, which country became the subject of his first literary production, entitled 'The Laws and Customs of the People of Bogos,' a work published in 1859, illustrated by a map compiled from his own surveys, by M. J. M. Ziegler of Winterthur. A portion of this work had previously appeared in Malte Brun's 'Nouvelles Annales des Voyages,' in September, 1858. Another Memoir, 'On the Northern Border Countries of Habesch (Abyssinia)' came out in the 'Zeitschrift für Allgemeine Erdkunde.' Berlin, Neu Folge III., p. 177.

In the year 1861 he was engaged as a Member of the German Expedition in search of the celebrated Dr. Vogel, first as philologist and afterwards as chief of the Expedition, an account of which was published in Petermann's 'Geographische Mittheilungen,' 1862, p. 98 ('Ergänzungshefte,' Nos. 6—13). In 1863 he paid a visit to his native country, after an absence of ten years; but he had become, by his long residence, so habituated to the freer life of the Bogos country and its unsophisticated people that he soon got tired of the conventional polish of a civilised country, and made arrangements for his speedy return. He employed his time whilst in Switzerland, however, to good purpose in working up his extensive African knowledge, and, as results, published in 1864 his most important book, 'Ostafrikanische Studien;' besides smaller treatises, such as 'Vocabulaire de la langue Tigre' (Leipzig), and others. He returned to Massowa in 1864. Soon afterwards commenced the troubles with King Theodore, of Abyssinia, which led to the English Expedition of 1867. In the preparations for this Expedition, especially as regards reconnoitring the alternative routes between the sea and the Abyssinian Highlands, Munzinger rendered great service to the English forces. Colonel (now General Sir William) Merewether, our Political Resident at Aden, who, as is well-known, directed all these preparations, obtained for Munzinger the post of British Consul at Massowa in October, 1865. The zeal, fidelity, and ability with which he fulfilled the arduous duties which subsequently devolved upon him were at the time freely acknowledged. During the early part of 1867 he accompanied Colonel Merewether to Ailet and the plateau of Agametta, and roughly surveyed two passes into the interior in the direction of Kiaquor. In June of the same year he undertook, for the same purpose of discovering the best route for the English army, an arduous and toilsome journey through the little-known Afar country, lying between

Amphilla Bay and the lower slopes of the Abyssinian plateau, an account of which, illustrated by an excellent map supplied by himself, was published in the 39th volume of our 'Journal.' During the march of the Expedition to Magdala, Munzinger accompanied Colonel Merewether as interpreter, for which his thorough knowledge of Amharic and English, his local knowledge, and his frank conciliatory conduct with the natives, well fitted him. When a special mission to Kassai, the Prince of Tigre, was determined on, Munzinger was also found indispensable as interpreter to Colonel Grant, the chief of the mission; and when nearer Magdala, he was employed on a still more delicate mission, in advance of the expeditionary forces, namely, to the camp of Dadjatsh Mashesha, the uncle of Gobazyé, by which he obtained that exact information regarding the topography of the region which enabled him to point out to the English Commander-in-Chief the best route to Magdala.

It is greatly to be lamented that these services to the British Expedition failed to meet with due reward and recognition on the part of our Government. It was only after considerable external influence was brought to bear, and after a question had been asked in Parliament by Mr. Melly, that the Companionship of the Bath was offered to him. Sir Roderick Murchison, backed by an address signed by all the leading men of science of Switzerland, endeavoured to obtain for him more substantial recognition, but failed.

In 1870 Munzinger accompanied Captain Miles on his excursion from Aden into the interior of Southern Arabia, an account of which was published in vol. xli. of the 'Journal' of the Society.. In 1871 he entered the Egyptian Service as Bey. In 1872 he was raised to the rank of Pasha of Massowa, and soon afterwards the Pashalik of Suakim was added to his Government. His efforts were henceforward directed to the development of the resources of his adopted country, extending from the shores of the Red Sea to Kassala. He established a system of water-supply for Massowa, and constructed a dyke to connect the island with the mainland. All his energies were directed towards the improvement of the people committed to his care.

After three years of peaceful life in his pashalik, the designs of the Egyptian Government with regard to Abyssinia necessitated the despatch of Munzinger to the Southern Kingdom of Shoa, and he set off on this ill-fated Expedition on the 1st of October, 1875. The population on the route to the capital of Shoa were hostile to the

Egyptian Mission, and prepared an ambuscade to destroy the whole Expeditionary party; few returned to tell the disastrous story of the massacre of their leader and his followers. From the account given by survivors, it appears that Munzinger, accompanied by his wife, landed at Tajurra on the 5th of October, and left that place for the interior on the 27th of the month. His Expedition consisted of 350 soldiers, 2 guns, and 45 camels. Its errand was to open up the road between Tajurra and Ankober, and enter into communication with King Menilek, an envoy from whom, Raz Buru, who had been on a mission to the Khedive, was returning in company with it. On reaching Lake Aussa, on the 14th of November, the Expedition was attacked in the night by a large body of Gallas; a disastrous retreat ensued, and Munzinger and his wife were struck down whilst struggling gallantly against overwhelming numbers with a small party of his followers. Of the whole Expeditionary party, three only survived to return to Massowa and tell the story of the disaster; and a story more harrowing in its details has rarely been given to the world. The work of butchery was carried on for days along the line of retreat over the inhospitable desert, one of the Europeans, Herr Haggemacher, dropping dead from exhaustion on the fourth day. Munzinger was left, at his own request, to die, when there was still a chance of some of his attendants escaping with their lives to the coast.

The Marquis de SÁ DA BANDEIRA.—In our obituary list of the present year we have to record the loss of one of the most illustrious of our Honorary Corresponding Members, the late Marquis de Sá da Bandeira, who, as a soldier, a statesman, and a cultivator of literature, had for fifty years held a prominent position in Portugal, and who has left a name which will ever be honoured and remembered with affection in the history of his country.

He was born in 1795; and at the age of fifteen, when Portugal was invaded by the French, he enlisted as a volunteer in a cavalry regiment, and, as such a time was favourable to promotion for a young officer of merit, in 1812 he was promoted to a cavalry lieutenancy. In 1814 he was severely wounded at Viella, near Tarbes, in the Department of Gers, in France. He lay helpless on the ground, with two sabre-cuts on the head, a spear-thrust in the elbow, and two wounds in the right side, and would have perished had not a French officer, who was out in pursuit of the plunderers of the dead, found him still alive, and undergoing the operation

of being pillaged. The officer immediately raised him, gave him relief, and took him prisoner.

In 1832 we find him raised to the rank of Lieutenant-Colonel for his services in the Azores. In the action of Alto da Bandeira, during the civil war between Dom Pedro and Dom Miguel, his right elbow was fractured by a ball. With determined stoicism, he kept his wound a secret, and led his troops to victory against a far superior force; but his arm had afterwards to be amputated. For this act of heroism he was rewarded with the rank of Officer of the Tower and Sword, and the title of Baron de Sá da Bandeira.

For a short time in 1834 he was Military Governor of the Algarve, and, on retiring from this post, he entered the Ministry. In 1837 he was made Lieutenant of His Majesty in the northern provinces of the kingdom. He was many times Minister, and always on the side of the people; for, although a staunch Monarchist, and devotedly loyal to the house of Braganza, he lost no opportunity of conscientiously defending the rights of the lower classes. While he was in office after the revolution of the 9th of September, 1836, Portugal was indebted to him for the establishment of the following important institutions:—The Polytechnic School, the Army School, the Industrial Institute, the Academy of the Fine Arts, and the Conservatorio of Dramatic Art. It was in his Ministry also that there was issued the Decree of the 10th of December, 1836, abolishing slavery. There were two great objects to which the Marquis de Sá da Bandeira devoted the energies of his life, viz., the abolition of the slave-trade and the fortifications of Lisbon. So earnest was he in the former cause, that his zeal won for him the name of "The Wilberforce of Portugal." He was a great lover of Geography, and very proud of being an Honorary Corresponding Member of our Society. In a private letter, the Marquis de Souza Holstein, speaking of the recently-established Geographical Society of Lisbon, says: "Our good friend the Marquis de Sá did not live to see the fulfilment of the desire of all his life. It is owing to his efforts that this impulse has been given to geographical studies in our country." Geography is indebted to the Marquis, in conjunction with Lieut.-Colonel Fernando da Costa Leal, for an excellent map of Angola, which was published at Lisbon in 1863. It was the Marquis de Sá da Bandeira who, in 1839, erected on the promontory of Sagres, near Cape St. Vincent, a monument to its former resident, Prince Henry the Navigator, to whom the world is indebted for the discovery,

within one century, of one-half of the globe which it inhabits, including Australia.

The deceased nobleman was the first Baron, Viscount, and Marquis de Sá da Bandeira, and for twelve years before his death he had been a General of Division. In the noble words of his epitaph, indited by himself, we have an epitome of his character. It says: "In serving his country, he served his own convictions. He dies satisfied, and his country owes him nothing."

Count ANNIBALE RANUZZI, born at the beginning of the century in Bologna, was one of those who most diligently strove to awaken and diffuse in Italy the love of geographical studies at a time when they were neglected, and almost excluded both from public and private schools. The Geographical Societies of Paris and London had only been established a few years, when Ranuzzi entertained the hope that a similar institution might be founded in Italy; and at the close of 1835 he commenced, with this object in view, an epistolary correspondence with the Commendatore Cristoforo Negri, then a young Professor in Milan. Italy being divided into many States, and the spirit of combination everywhere repressed by political suspicion, and it being impossible to animate, through the medium of an encouraging and popular press, the realisation of the fond idea of Ranuzzi and of Negri it became a failure. What was wanted was that their views should be formulated and brought before public attention, so that indifference might be awakened; but the utterance was wanting, and the plan fell through. Nevertheless, Ranuzzi undertook the publication of a Geographical Annual, which, when the circumstances of the author and the times were taken into consideration, had real merit, and deserved a greater circulation; but it only lasted for three years. With the events of 1848 a new light dawned upon Italy, but soon it became confined to Piedmont only, and even here political anxieties interfered with the calmness and serenity of study. At length, with the war of 1859, the barriers began to give way; the minor States crumbled away, and rapid progress was made towards the unity of the nation. Count Ranuzzi entered on the career of politics, and was appointed Governor of some leading cities, and notably of Sienna. Although he continued to entertain a keen love for geographical studies, age, the necessity of economy, and the occupations of his career, prevented him from again attempting to lay the foundation of an Italian Geographical Society, or to continue the

Annual. At length his health failed him some years before his death. But now throughout Italy the times were becoming more tranquil and more free. The press, in a hundred articles, disseminated the notions propounded, and invited emulation. In addition, the National Government gave its support and encouragement. Now the old friends and companions of Count Ranuzzi were able openly to unfold the banner, and to make it victorious. The Italian Geographical Society was founded mainly through the instrumentality of Ranuzzi's old friend and coadjutor, the Commendatore Cristoforo Negri, who became its first President.

General Dufour.—This eminent geographer, for many years known to the scientific world as Director of the Topographical Survey of Switzerland, was one of our Honorary Corresponding Members, having been elected in 1863. He belonged to a Genevese family of old standing, and was born in 1787 at Constance, during the temporary emigration of his family from their native city. He was too young to feel the change when his country was annexed to the French Republic in 1798. In his early years he showed but little aptitude for study; but having heard by chance of the existence of the École Polytechnique at Paris, he was seized with a desire to enter it, and became one of its most zealous and able pupils. In the examination on entering the school he was admitted with the 140th rank only; but at the end of four months he exchanged this humiliating position for the 11th rank, and in less than two years he left as 5th. After his first examination he was promoted to the rank of sergeant, and was enabled by his pay to contribute to the support of his mother, who had been left in straitened circumstances. After his brilliant final examination, he had the prospect, according to the routine of the school, of spending two years in comparatively easy studies and pleasant military life at the School of Practical Engineering at Metz; but young engineers were then greatly needed, and he was hurried off from Metz with four other cadets, on the order of Napoleon, to proceed to Corfu, then recently dismembered from the Venetian Republic.

At Corfu young Dufour and his companions were placed under the command of Colonel Baudraud, who had then the management of the fortifications in the Ionian Islands. During the early part of his stay here Dufour wrote, without any aid from books, a treatise on perspective, a subject which was always a favourite one with him in after-life. When Corfu was blockaded by the English, he

was made temporarily prisoner by a boat-party of the assailants, having been seized whilst swimming in the sea, after being badly burnt by an explosion of cartridges; but he was so much injured that he was landed again at Corfu by his captors.

At the peace of 1814 he was relieved by a Royal fleet and taken to Marseilles; and after Napoleon's return from Elba, he was employed in an attempt to raise a line of fortifications around Lyons against the Austrians. On the dissolution of the French army after the battle of Waterloo, he was allowed to withdraw to Geneva, on half-pay, and with the decoration of the Cross of Honour. In 1817 he was offered a command at Briançon, on the condition of adopting the French nationality; but he had resolved to sever himself from the French connection, and refused the offer, resuming his status as a Swiss citizen, to which he adhered for the remainder of his long and honourable life. He married in the same year, 1817, and was soon after promoted to the rank of Commandant of Engineers in the Federal Army.

Dufour was now entrusted with the superintendence of the Cadastral Survey of the Canton of Geneva and the execution of a new map of the Canton, in four sheets, on the scale of $\frac{1}{25000}$. He was also appointed Professor of Mathematics, and was the first who taught Descriptive Geometry. Among his numerous pupils were Sturm, Auguste de la Rive, the Crown Prince of Denmark, Prince of Holstein, and the Grand Duke of Mecklenburg-Schwerin. In 1819 he created the Federal Military School of Thoune, in which he remained chief instructor of the Staff and of Engineers down to the year 1830, when he had the honour of receiving there, under his own tuition, the late Emperor of the French, then Prince Louis Napoleon. As Colonel in the Federal service, in 1827, Dufour commanded the first field manœuvres executed by the Federal Army, to the consolidation of which many of the years of his life were patriotically devoted. It was during these manœuvres, whilst engaged in drawing the sketch of the plan of operations, that our Honorary Corresponding Member, M. Paul Chaix, to whom I am indebted for these biographical details, became acquainted with Dufour, with whom he ever afterwards maintained the most affectionate relations. After the manœuvres, Dufour, as was his habit for many years, undertook, with a select party of his best pupils and young officers, pedestrian excursions of reconnaissance along the frontiers of Switzerland—excursions occupying several weeks—during which he set the example of cheerfulness under the trying

circumstances of physical discomfort, and exercised their endurance in daily marches of fourteen hours.

His engineering works at Geneva will remain a lasting monument of his skill. He lined both banks of the Rhone with beautiful quays, and built many bridges. All public improvements were promoted by him—sometimes in the teeth of strong opposition—such as the introduction of steam-navigation on Lake Geneva, and the lighting of the city with gas. He instituted elaborate measurements of the discharge of the Rhone, and established an astronomical observatory and a limnimetrical observatory on the lake. Notwithstanding his numerous public duties, he found time during all these years to give voluntary lectures on perspective and elementary astronomy, and took an active part in the proceedings of the Society of Arts and the Geographical Society of Geneva.

But Dufour's greatest work as a geographer, the most important result of his scientific activity, was undoubtedly the Federal map of Switzerland, on the scale of $\frac{1}{100000}$. It was in 1833 that he was first entrusted with this great undertaking, which, after thirty-two years of unceasing exertions, he had the happy fortune to complete. In executing the triangulations necessary to this great work, he had to train a staff of active, devoted, and skilful officers, inured to hardship, and admirers of the beauties of the regions they had to survey. In honour of this work, the Federal Council in 1868 adopted the name of Dufour Spitz for the then unnamed highest peak of Monte Rosa.

It is not the place here to dilate on the political side of General Dufour's career, although this would be essential to a just estimate of his life and character. Suffice it to say that he took a prominent part in establishing and afterwards maintaining the Federal constitution of his native country, and in 1846 was entrusted by a majority of the Confederation with the melancholy duty of leading its army against the revolted Catholic Cantons. Thanks to the completeness of the measures taken, and the humanity with which Dufour conducted the campaign, the contest was soon brought to a termination, and comparatively little bitterness left as a result of the strife. When, on the re-establishment of peace, the Federal Assembly voted to the successful general a flattering address and the sum of 60,000 francs, Dufour immediately made over a part of the latter to the charitable fund for the wounded of both sides.

The habits of General Dufour throughout life were frugal, and his temper amiable. He was rewarded by a robust and happy old

age. Finally his health was broken down by sorrow at the loss of one of his daughters, whom he soon followed to the grave, on the 14th of July, 1875. The day of his funeral at Geneva was observed as a day of general mourning.

The Marquis GIAMMARTINO ARCONATI VISCONTI belonged to one of the noblest and most opulent families of Upper Italy. He was the son of the Marquis Giuseppe and of the Countess Costanza Trotti. After 1821 his father was compelled to absent himself from Italy in consequence of the part which he had taken in the political movements of Piedmont and Lombardy, and it was during his absence in Germany that Giammartino was born, in 1839. The family returned to Italy in 1848, and established itself no longer in Milan, where it had originally been seated, but in Turin. The Marquis Giammartino, however, remained mostly in Paris, London, and in Belgium, where his family possessed a magnificent chateau, which formerly belonged to Count Egmont. He was a man of most amiable manners, of keen intellect, and devoted to the study of the natural sciences. He had a complete mastery of the different Italian dialects, and was also acquainted with Arabic. In company with his friend, Count Emilio Dandolo, he made a voyage to the Nile, and reached beyond Khartoum, but fell seriously ill, and with difficulty was able to make his way back to Egypt. This voyage of the two friends was described with elegant simplicity by Count Dandolo, and published. In another journey the Marquis Arconati crossed Arabia Petræa, and thence, by the desert, made his way to Jerusalem. He himself composed the narrative of this journey, and published it in a costly style, and with a map made expressly for it by Kiepert. He had then set on foot some excavations in Arabia Petræa, and returned to Egypt to give instructions about them, and was present at the opening of the Suez Canal.

In the war of 1859 he entered as officer in a battalion of Bersaglieri to fight for the independence of Italy. At the close of the war he was appointed Second Secretary to the Commendatore Cristoforo Negri, then charged with a mission to China, Japan, and Siam, to conclude the Italian treaties with those States. But causes independent of his will, and that of the Commendatore Negri, brought about a suspension, and finally the abandonment of the expedition.

The Marquis was amongst the first who combined to found the Italian Geographical Society. On the death of his parents, being

the only representative of his family, and already suffering from incurable ailments, he chose Florence for his home, and in the intervals of suffering occupied himself with the fine arts, which he encouraged with his large fortune. He died in Florence at the beginning of the present year, at the early age of thirty-six. With him terminated a life which might have been an honour and an advantage to Italy, and a family whose nobly-employed wealth was a source of succour to many of the most illustrious Italians who were driven from their country in that period of persecutions and political animosity which lasted from 1821 till 1848. He joined our Society as a Life Member in 1866.

THOMAS BAINES, the well-known African traveller and painter of African scenery, died at Durban, Natal, on the 8th of May, 1875, whilst preparing for another of his numerous expeditions into the unexplored interior of the Continent. He was a man of marked individuality of character, a born artist and explorer, a lover of wild life, and skilled in all the shifts and resources of an explorer's career. Few men were so well endowed with these and other qualifications for successful African travel, and perhaps none possessed greater courage and perseverance or more untiring industry than Baines. He was born at King's Lynn, in Norfolk, in 1822, the second son of a master mariner of that place. After receiving such an education as the views and circumstances of his parents admitted, he was placed with a coachbuilder to learn the art of heraldic painting on carriage-panels; but a strong innate love of art soon led him to more elevated subjects, and he devoted much of the leisure time of his youth to sketching marine subjects from nature along the coasts of his native county. His ardent imagination fired him with a desire to see foreign countries, and in 1842 he left England for the Cape of Good Hope. It was in Cape Colony and in the neighbouring countries of South Africa that he was destined to pass the greater portion of his subsequent life; and it was here that he became better known even than in his native country. In fact, few men were thought so much of or talked so much of for many years in our South African Colonies as the Artist-traveller, Thomas Baines. His extreme unselfishness and willingness to oblige, his prolific pencil, ready for anything—African landscape, scenes of native war, animal and Caffre life, or portraits of his friends—and his fluent pen, kept him continually before the Colonial public and made him popular. It is to be re-

marked also that many friendships which he formed in the Colonies were kept with constancy to the end of his life. In 1846–7 he left Cape Town and proceeded to the then nearly unknown regions to the north of the colony for the purpose of sketching the scenes and incidents of the Caffre war then waging. Again, in the subsequent wars of 1851–3, he was busily engaged on the frontier in similar work, he having been attached to General Somerset's Staff during the campaigns, through the intervention of his faithful friend, Mr. R. White. Several hundred sketches, displaying great vigour and vivid local character, were the results of his labours; many of which have since been on exhibition, with his other works, in London and Dublin. On the 6th of November, 1851, he was present at the action with the rebel Hottentots at Water Kloof, when Colonel Fordyce, of the 74th Regiment, was killed; and in fact Baines, in his desire to sketch faithfully scenes of actual battle, generally strove to be in the front, and he was rich in anecdotes of adventure and narrow escape in presence of the savage enemy.

At the conclusion of the war in 1854 Baines returned to England, and was soon after his arrival, at the recommendation of our Council, appointed artist to the North-West Australian Expedition, under Mr. Augustus Gregory. During this arduous undertaking he distinguished himself and earned the approval of his leader and the Colonial Office by the zeal and ability with which he carried out a special mission with which he was entrusted, namely, a voyage in a schooner from the Victoria River to Java to procure fresh provisions for the Expedition, after their traverse by land from the Victoria to the Albert rivers. The large series of sketches in oil made by Baines during this, as well as the subsequent Zambesi Expedition, were afterwards divided between the Kew Museum and our Society. On the termination of the Expedition in 1856, Baines returned to England, and in revisiting his native town was presented with the freedom of the borough by the Corporation.

When the Zambesi Expedition, under Dr. Livingstone, was organised, early in 1858, Baines was selected to accompany it as artist and storekeeper. An unhappy disagreement with Mr. Charles Livingstone, the brother of the great traveller, led to Baines' retirement, much against his own wishes; and he proceeded to the Cape. His love of exploration was at this time as keen as ever, and having become well versed in the use of astronomical and surveying instruments, under the supervision of Sir Thomas Maclear, Astronomer Royal at the Cape, he accepted the invitation of his

friend, Mr. Thomas Chapman, an ivory-trader, to accompany him in a journey from the south-west coast to the Victoria Falls of the Zambesi. An account of this journey was published by him in 1864, on his return to England, under the title of 'Explorations in South-West Africa; being an Account of a Journey in 1861–2 from Walvisch Bay to Lake Ngami and the Victoria Falls.' Besides a complete route-survey, and very numerous sketches, Baines made on this journey a collection of objects of Natural History. He spent several weeks at the Victoria Falls, making drawings and measurements; and published, besides the narrative just mentioned, a folio volume of coloured lithographs of this remarkable cataract.

The years 1864–8 Baines spent in England, employing himself in bringing out the works above mentioned, lecturing, writing, and drawing illustrations for various periodicals. His industry was without limit. Early and late he was to be found in his painting-room, or at the desk, and his time and abilities were at the service of any one who needed them, with or without payment; for amongst his most striking characteristics was an utter indifference to worldly considerations. At the end of the year 1868 he again went out to Africa, under engagement with a Company to explore the Goldfields of the Tati, recently discovered, or re-discovered, by Carl Mauch and Mr. Hartley. He succeeded in obtaining the friendship of Lo Bangolo, the successor of the celebrated Mosilikatze, the paramount chief of the region in which lay the Goldfields. From him he obtained valuable concessions for the Company he represented; but nothing came of all his toilsome journeys and successful diplomacy; the distances were too great, and the Company had no capital. Baines was never reimbursed his expenses, and had, on his return to Natal, to toil again as an artist to obtain a livelihood. The results of his explorations in the Gold region were, however, of considerable importance to Geography. He mapped very carefully the country, and the route thither from the capital of the Trans-Vaal Republic, and wrote a description of the region, which is now about to be published under the editorship of his old and tried friend Mr. H. Hall, of Cape Town. A reduction of his map was published in our 'Journal,' vol. xli., in illustration of an abridgment of his Journals by Dr. R. J. Mann. In 1873 our Council recognised the value of Baines's geographical services by presenting him with a testimonial gold watch. He undertook, subsequently, other journeys into the adjoining Caffre countries, always mapping most carefully his

routes, and sketching scenery and people. After a visit to Port Elizabeth, he planned a new journey, almost alone, to the Gold district north of the Tati, taking with him a small quartz-crushing machine; and had prepared all his outfit and waggons for the journey, when he was struck down by the old enemy of so many African travellers—dysentery, at Durban, and died, as before stated, on the 8th of May, 1875.

Commodore JAMES GRAHAM GOODENOUGH.—The tragic death of this distinguished officer and good man at the hands of the savage natives of the Santa Cruz Islands, in the Southern Pacific, was an event which caused the profoundest grief amongst his connections and friends, many of whom, like himself, were prominent men in geographical circles. He was born on the 3rd of December, 1830; the second son of Dr. Goodenough, Dean of Wells, one of the original members of our Society, and a contributor to the first volume of our 'Journal.' Young Goodenough was sent to Westminster School at the early age of nine and a-half, and entered the Navy as naval cadet on board H.M.S. *Collingwood* in May 1844. As a midshipman he was distinguished for his modesty, courage, high principle, and the vigour of his character. He naturally took the lead in everything: the best as a linguist, in navigation, in seamanship, in gunnery, and all exercises, and among the foremost in all expeditions. He took to sea with him Burney's 'Collection of Voyages in the South Sea,' which he read carefully; and he thus acquired a love for such narratives, and for the achievements of daring navigators and explorers, which continued to the day of his death. He received his first lessons in surveying from Captain (afterwards Sir Henry) Kellett, then in command of the *Herald*, who kindly gave him some practical instruction in Callao Bay and round San Lorenzo. When the *Collingwood* was paid off in July 1848, Goodenough joined the *Cyclops*, under Captain Hastings, and went to the coast of Africa. But he shortly returned on leave, and entered the Naval College, where, after a year's close study, he obtained his commission, and was promoted to the rank of Lieutenant in June 1851. From September of the same year to May, 1854, he served on board the *Centaur* flag-ship, on the Brazilian Station.

He was in the Baltic during the Russian war, and was engaged with the rocket-boats at the bombardment of Sweaborg. In February, 1856, he was appointed to the command of the gunboat *Goshawk*; and towards the end of that year went out to China as

first Lieutenant of the *Raleigh*, when she was lost. He afterwards joined the flag-ship *Calcutta*, and was actively employed in the operations of the Chinese war, being gazetted for his services on four occasions during that period. On the day of the capture of Canton, 26th February, 1858, he was promoted to the rank of Commander; and in August 1859 returned to England. But he returned to China almost immediately afterwards as Commander of the *Renard*, and served in the action when the Taku Forts were taken; again returning home in 1861.

In May, 1863, Goodenough was promoted to the rank of Captain, and was on shore for nearly eighteen months. He had always kept up his studies, linguistical and scientific, and during this period of well-earned leisure showed the direction of his tastes by joining the Royal Geographical, the Astronomical, and the Hakluyt Societies. He took an active part in the Geographical Section at the busy meeting of the British Association at Newcastle in 1863. From December 1863 to April 1864 he was in the United States, usefully employed in examining the American dockyards, for which service he received the thanks of the Lords of the Admiralty. In May 1864 he married the daughter of Mr. W. J. Hamilton, our former President, and in November 1864 resumed active service in the Mediterranean. From May 1867 to 1870 he commanded the five-masted iron-clad *Minotaur*.

In the autumn of 1870 Captain Goodenough, accompanied by his wife, undertook to assist in personally distributing the 'Daily News' Peasant Relief Fund at Sedan; and in the February following he was employed in revictualling Paris after the Prussian siege. Subsequently he was commissioned to visit and report upon the naval establishments of Russia, Austria, Italy, and France—a service for which his accomplishments as a linguist, his urbanity, and his extensive general knowledge well fitted him. He returned to England in the autumn of 1872, and in May 1873 was appointed to the *Pearl* as Commodore on the Australian station.

The *Pearl* arrived at Sydney in August, 1873, and during his passage out Commodore Goodenough communicated a very interesting paper on Amsterdam Island to the 'Geographical Magazine.' Having, shortly after his arrival, been appointed Joint Commissioner with Mr. Layard to report on the advisability of accepting the cession of the Fiji Islands, he proceeded to Levuka to perform that responsible service. His report on the Fijis presented to Parliament is a full and admirable State Paper, which

had great influence in deciding the questions relative to the annexation of the islands. Fiji became a British colony on the 10th of October, 1874.

After conveying Sir Arthur Gordon, the Governor of our new possession, to Fiji, Commodore Goodenough sailed from Levuka in the *Pearl*, with the object of visiting the different islands of the New Hebrides and Santa Cruz groups, of conciliating the natives, and especially of acquiring full information respecting their relations with white men. Visiting the islands in succession he arrived off Carlisle Bay in Santa Cruz on the 12th of August, 1875. Here he landed in the hope of entering into friendly intercourse with the suspicious natives. The savages assembled on the beach and accepted the presents offered to them. Trusting in their pretended friendliness the Commodore entered their village and passed some time in amicable intercourse with them. But when preparations were made to embark, a savage discharged a poisoned arrow, which struck the Commodore in the left side, and before the firearms could be reached several flights of similar arrows were shot at the party, wounding five men, including their commander a second time. The wounded being re-embarked, the *Pearl* proceeded to Brisbane, but all hopes of saving the lives of the beloved Commodore and of two of the wounded men were soon found to be vain. On the 18th symptoms of tetanus appeared, and on the 20th he died, entreating with his last breath that no vengeance should be taken on the natives for the cruel deed they had committed. Thus he died as he had lived, a self-sacrificing, noble-hearted Christian gentleman.

The Earl of Sheffield.—Although not known as a traveller or geographer, the late Lord Sheffield merits a place in this record for the interest he always took in our proceedings, and the constancy of his devotion to the interests of the Society. He had been a Fellow so long ago as the year 1846, and between the years 1852 and 1864 served nine times as Member of our Council. He was, moreover, a regular attendant at the social gatherings of the leading geographers and friends of the Society. The late Earl was the only son of John, the first Lord Sheffield, and friend of Gibbon the historian, and was born in 1802. He succeeded to the title on the death of his father in 1821. In June, 1825, he married the eldest daughter of the second Lord Harewood, by whom he leaves two sons and a daughter. His eldest son, who now succeeds to

the family honours, was, as Lord Pevensey, attached to the British Embassy at Constantinople from 1853 to 1856. Lord Sheffield died on the 5th of April last, after an illness of several months' duration.

Bishop Thirlwall.—In a great Society like ours it is obvious that we shall occasionally find among its Fellows men of high renown in whose case the science of Geography has not been the distinctive speciality by which their fame has been achieved. We are, however, not the less proud of seeing the list of our Members honoured by their illustrious names. Eminent among such was the Right Rev. Connop Thirlwall, late Bishop of St. David's, whose death during the past year it is my sad duty to record. This distinguished scholar, historian, thinker, and theologian, was in his seventy-ninth year when he died in the month of July last, having been born on the 11th of January, 1797. Educated by his father, the Rev. Thomas Thirlwall, he exhibited a precocity which almost verges on the incredible. At the age of three he was taught Latin. At four, according to his father's account, he read Greek "with an ease and fluency which astonished all who heard him." At seven he began to write sermons, and he filled up his leisure moments with writing poetry. His 'Primitiæ, or Essays and Poems by Connop Thirlwall, eleven years of age, with a Preface by his Father,' published in 1809, was the firstfruit of this tendency of his mind. The wonder is that such precocity was not followed by an early failure of power. How far the contrary was the case it needs not the testimony of my pen to declare to any reader of the English language. His education at the Charterhouse under Dr. Raine, the then Head-master, would, doubtless, exercise a very wholesome influence in steadying the processes of thought, and in checking the somewhat too luxuriant growth of an exceptional intellect like this. In fact, we find that from this time he gave up writing poetry altogether. One of his most remarkable faculties was his great facility in mastering languages. It is well known that on his accession to the Episcopate of St. David's, he made it a duty to be able to address his people in their own language; and in the course of six months he was able to preach to them in Welsh. The vast extent of his reading, combined with the independent freedom of his habit of mind, gave him a generalising grasp of thought which was of the highest value when brought into joint action with his wonderful power of minute criticism. Of the latter quality we

have a notable example in his 'Essay on the Irony of Sophocles.' It is now forty-one years ago that he appeared as the author of the first 'History of Greece' really worthy of the name in the literature of England. But of course it was as a Churchman and theologian that Bishop Thirlwall stands most prominently conspicuous in the minds of men. In this direction boldness and impartiality seem to stand out as his most striking characteristics. And although it would ill become me here to touch on the many-headed subject of theology, I think I may with all safety utter a word of commendation on that wise tolerance which enabled Bishop Thirlwall to see and openly to acknowledge what was good in the tenets and practices of others, with whose creed he himself was essentially at variance. It was this grand quality producing great breadth of charity, as the legitimate offspring of great breadth of thought, which gives their truest point and value to the judicious words which have been engraved on the granite slab over his grave, "Cor sapiens et intelligens ad discernendum judicium." Under that granite slab in Westminster Abbey he appropriately lies buried side by side with his brother historian, George Grote.

Earl Stanhope.—Among the distinguished men whose loss we have to deplore this year, the late Earl Stanhope takes a very prominent place, as having exhibited qualities which add dignity to rank, and honour to an already honoured name. The eldest son of the fourth Earl, he was born at Walmer, Kent, on the 30th of January, 1805. Under his courtesy-title of Lord Mahon, he sat in Parliament, with only slight interruptions, from 1830 to 1852. He served under Sir Robert Peel, as Under-Secretary of State for Foreign Affairs, in Sir Robert's short administration of 1834–5; and again, as Secretary to the Board of Control, in 1845–6. Conjointly with the present Lord Cardwell, he also became Sir Robert Peel's literary executor. It was not, however, in connection so much with politics or statesmanship that Lord Stanhope was to found his reputation. It is as an historian and essayist that his name will be transmitted with honour to posterity. His most noted work was his 'History of England from the Peace of Utrecht down to the Peace of Versailles.' His Lordship subsequently published 'The History of England during the reign of Queen Anne down to the Peace of Utrecht;' thus connecting his previously published 'History' with the brilliant narrative of Lord Macaulay. His other works were, a 'Life of Belisarius,' 'The Court of Spain

under Charles II.,' 'A History of the War of Succession in Spain,' a 'Life of the Great Condé,' a 'Narrative of the Insurrection of 1745,' a 'History of the Rise of our Indian Empire,' and several articles in the 'Quarterly Review.' Those who were acquainted with Lord Stanhope personally, recognised in him, when occasion offered, a mastery of the French language, so graceful and so perfect—both as to construction and rhythm—as could not easily be surpassed by any but a Frenchman born. In 1846, his Lordship was elected President of the Society of Antiquaries, a post which carried with it a Trusteeship of the British Museum; he was also President of the Royal Literary Fund, a Fellow of the Royal Society, a Foreign Member of the Institute of France, and an Honorary Doctor of Laws of the Universities of Oxford and Cambridge. To him also, in conjunction with the late Lord Derby, we are indebted for the establishment of the National Portrait Gallery. In 1858 he was elected Lord Rector of the University of Aberdeen; and in the yet more important University of Oxford he is known not only as the Founder of the 'Stanhope' prize for the study of modern history, but as having been on several occasions Examiner on his own special subjects. Lord Stanhope had been a member of our Society for twenty-one years, and although the bent of his mind leaned less, perhaps, to our own peculiar topics than to those of history and antiquity, enough has been said to show that in him we have lost a very distinguished member of our Society. His Lordship died at Bournemouth, after a short illness, on the 24th of December last.

Lieutenant-Colonel Alexander Strange.—This distinguished officer, who in his later years occupied an important position in the scientific world, was not originally destined for the scientific branch of the military profession. He was born on the 27th of April, 1818, the fourth son of Sir Thomas Strange, and after completing his education at Harrow School, was sent to India in 1834, where, at the age of sixteen, he joined the 7th Regiment of Madras Light Cavalry. Some time afterwards, the scientific bent of his mind was discovered by General Worster, who himself instructed the young cavalry officer in the use of astronomical and surveying instruments, and to such effect that the pupil became well versed, not only in the use but in the construction of the instruments. After thus thoroughly qualifying himself, he received, in 1847, an appointment on the Great Trigonometrical Survey of India, where his abilities

and skill found an ample field for their exercise. The section of the great Survey which was first allotted to him was the "Karachi Longitudinal Series"—a triangulation embracing an area of 23,000 square miles, and a length of country of 670 miles, from Sironj, in Central India, to Karachi. Afterwards he was employed on the "Coast Series" along the eastern side of the Peninsula. He was occupied in this latter work in the Goomseor Hills in 1857, when his labours were cut short by a severe attack of jungle fever, which necessitated his removal to the Neilgherry Hills for the recovery of his health. After attaining the rank of Major he retired from the Survey, and in 1857 finally left India for England, after twenty-six years of continuous service. In 1862 he was appointed to the post of Inspector of Scientific Instruments for the Indian Services. As an active member of several of the learned Societies of London, Colonel Strange became, during subsequent years, a well-known man in scientific circles; and he employed his knowledge and experience to good effect in agitating for the fuller recognition, on the part of Government, of the importance of encouraging scientific instruction and research. In 1868 he succeeded in obtaining the co-operation of the British Association in this movement, which resulted in the appointment by Her Majesty's Government of the recent "Royal Commission on Scientific Instruction and the Advancement of Science," under the presidency of the Duke of Devonshire, which, after its five years' labours, has issued a Report embodying all the chief points of the scheme which the originator of the movement had at first propounded. Colonel Strange was a Fellow of the Royal Society, and served on the Council of that body from 1867 to 1869. He was elected Fellow of the Royal Geographical Society in 1861. The only paper which he contributed on a geographical subject was one on a small Altazimuth instrument, which he had invented for the use of travellers in unexplored regions. This was communicated to the Geographical Section of the British Association at Exeter, under the presidency of Sir Bartle Frere. He died on the 9th of March last, at the age of fifty-seven.

SIR J. GARDNER WILKINSON, F.R.S.—This celebrated Egyptologist and traveller died at his seat in Glamorganshire on the 29th of October last, at the age of 78 years. His journeys and researches in Egypt commenced about the year 1822, and the first of his numerous contributions to the geography and antiquities of the

country with which his fame is indissolubly associated—'A Narrative of a Journey in the Eastern Desert of Upper Egypt,' undertaken by him in the spring of 1823—was published in the second volume of our 'Journal.' This Paper was accompanied by an excellent map, engraved by Arrowsmith, from his own surveys and drawings; for in all his journeys he carefully mapped the districts he traversed, and at the conclusion of his Egyptian travels he compiled from his own observations a large general map of the country, which I believe was never published, at least in its entirety; the drawing having remained in the possession of Mr. Arrowsmith, until the death of that distinguished cartographer. He was born in 1797, and educated at Harrow and Exeter College, Oxford. His first visit to Egypt was undertaken for the benefit of health, and being attracted by the marvels of the land, he devoted himself for many years to a minute investigation of its ancient remains and modern topography. His first independent work was the 'Topography of Thebes,' published in 1835; which was soon followed, in 1837, by his great undertaking, 'The Manners and Customs of the Ancient Egyptians,' in six volumes, copiously and beautifully illustrated by engravings made from his own drawings. This noble work immediately created for its author a great reputation as a profound Egyptian scholar and elegant writer; and an abridgment was published by himself, in two volumes, in 1854, under the title of 'A Popular Account of the Ancient Egyptians.' He was created a Knight in 1839. Meantime some of his more purely geographical dissertations were communicated to our Society; one, 'On the Nile, and the Present and Former Levels of Egypt,' in vol. ix. of our 'Journal': a second, entitled 'Some Account of the Native Lakes of Egypt,' in vol. xiii.; and a third, 'Remarks on the Country between Wady Halfeh and Gebel Berkel in Ethiopia,' in vol. xx. He became a Fellow of our Society in 1839, and served on the Council in 1841. In 1848 he published a narrative of a tour in the Sclavonic countries east of the Adriatic, under the title of 'Dalmatia and Montenegro, with a Journey to Mostar in Herzegovina.'

Sir William Edmond Logan, F.R.S.—This distinguished geologist, a fellow-worker of our former honoured President, Sir Roderick Murchison, died on the 22nd of June last, at the age of 77 years. He was born, it is stated, at Montreal, Canada, in 1798, but was educated at the High School and the University of Edinburgh.

After some years spent in commercial pursuits, during which he was able to devote much time to his favourite study, and especially to the investigation of the coal-fields of South Wales, he went on a geological tour to North America, visiting the coal-fields of Pennsylvania and Nova Scotia. Papers on these, and other kindred subjects, were in the mean time published by him in the 'Transactions of the Geological Society of London.' In 1842 Mr. Logan commenced his examination of the palæozoic rocks of Canada, an investigation carried out by him with great ability and success, resulting in his celebrated discovery of the Laurentian system of rocks, which Sir Roderick Murchison subsequently detected in the north of Scotland. In 1843 Mr. Logan was appointed Director-General of the Geological Survey of Canada, and in 1856 received the honour of Knighthood in consideration of his great services to science. He was elected Fellow of our Society in 1856.

Sir FREDERICK ARROW, Deputy Master of Trinity House, died on the 17th of July last at the age of 56 years. He had been a Fellow of our Society since 1871, and occasionally took part in the discussions at our Evening Meetings. Few public men were more esteemed, and his sudden death caused great sorrow among a large circle of friends. He was the second son of Captain William Arrow, of the late Indian Navy, and received his education at King Edward's Grammar School at Bath. In 1834, at the age of 16, he entered the Mercantile Navy, in which he served with great credit until 1859, when he became an elder brother of the Trinity House, and relinquished the active duties of his profession. After he had held this rank for five or six years he was elected to the post of Deputy Master of Trinity House, thus receiving the highest compliment to his skill and judgment which could possibly be paid. He fulfilled the duties of the office with so much distinction that in 1868 he received the honour of knighthood. Since 1865 he had also been an *ex officio* conservator of the River Thames, and a magistrate and Deputy-Lieutenant, not only of Essex, but also of the Tower Hamlets, and in all of these offices he discharged his duties with industry and conscientiousness.

JOHN BAPTIST ZWECKER.—This eminent artist, who was connected with Geography not only as a Fellow of our Society of twelve years' standing, but also as an illustrator of books of travel and exploration, was a German by birth, having been born at

Frankfort-on-the-Main on the 18th of September, 1815. He received his artistic education at Dusseldorf, and attained so much distinction by his drawings of animals before his twentieth year that he received an invitation to the Court of the late King of Wurtemburg, with whom he long resided on terms of friendly intimacy. He came to England in 1852, and after a time settled in London as professional artist. Although he produced in his time a number of works of high character in oil- and water-colours, he was chiefly known for the wonderful skill, facility, and truth with which he pencilled the scenery and native life of remote countries, often from the mere verbal descriptions of travellers or imperfect sketches. His pre-eminent ability in this unobtrusive branch of his art procured him almost constant employment during a long series of years. Among the numerous well-known books which he illustrated were Atkinson's 'Travels in the Regions of the Amur;' Magnusson's 'Legends of Iceland;' Livingstone's 'Zambesi and its Tributaries;' Andersson's 'Lake Ngami;' Petherick's 'Travels in Central Africa;' Winwood Reade's 'African Sketch Book;' Stanley's 'How I found Livingstone;' Sir S. Baker's 'Albert Nyanza;' Du Chaillu's 'Ashango Land;' Bates' 'Naturalist on the Amazons;' and Macgregor's 'Thousand Miles in the Rob Roy Canoe.' He died on the 10th of January last.

The Hon. J. W. Woodford Birch, who was assassinated by the Malays at Perak on the 2nd of November last, was one of our Associates, having been elected in 1871. He was the eldest son of the Rev. J. W. Birch, M.A., Vicar of All Saints, Hertford, and commenced his official career as a member of the Ceylon Civil Service. He remained in that island for the long period of twenty-four years, from 1846 to 1870, filling in succession many important posts, chiefly in the magistracy of the colony. His last appointment there was that of Government Agent of the Eastern Province, the affairs of which he administered with much ability. In 1870 he received the appointment of Colonial Secretary of the Straits Settlements and resided in Singapore, until he was promoted, in November, 1874, to the office of Resident at the neighbouring Malay State of Perak, where he was brutally murdered by a party of Malays under the influence of political excitement. Neither the personal character of Mr. Birch nor any question of his treatment of the natives had anything to do with the catastrophe, for he was a man always much respected by the populations over whom he had been placed. In

Ceylon, after his long period of service, he was so much esteemed, that when he left for Singapore in 1870 he was conducted to the wharf at Trincomalee by the whole native population, who with tears bewailed his departure.

The Right Hon. HOLT MACKENZIE was the son of Henry Mackenzie, the author of 'The Man of Feeling.' His early life was spent in the Civil Service of the East India Company. Commencing his career in India in 1807, he rose, through various appointments, to the position of Secretary to the Supreme Government in the Territorial Department, a post which he retained for many years. In 1831 he returned to England, and shortly afterwards retired from the service. From 1832 to 1834 he acted as a member of the Commission of the Board of Control, and soon after obtained a seat on the Privy Council. Here his long experience of India enabled him to render effective service whenever Indian subjects were under consideration. He died on the last day of March last, at the advanced age of 89, being then the oldest member, not a Peer, of the Privy Council, and one of the oldest servants of the Crown.

Besides the above-named, we have to regret the loss during the past year of the following Members, many of whom had distinguished themselves in other walks of life than Geography or Travel: H. Ansell, Charles E. Alforth, Francis L. Beckford, W. R. Blencowe, J. Bowman, Robert Broadwater, C. C. Brown, W. P. Bonnor, Thomas Baring, M.P., J. J. Bennett, Captain J. B. Caldbeck, Admiral F. A. B. Craufurd, W. R. Dalziel, A. Devaix, John Donne, John Elmslie, W. S. Elmslie, Rev. C. B. Elliott, J. Fisher, Ebenezer Foster, W. Griffiths, Sir Sills Gibbons, Bart., W. G. E. Hobbs, Right Hon. Thomas E. Headlam, Dr. H. Hadley, Dr. H. Hardinge, C. J. Latrobe, C.B., Walter M'Leod, R. McKerrell, J. H. Mackenzie, D. Macpherson, C. H. Marshall, Lucas Mavrogordato, G. Naylor, N. Plant, J. Paterson, Captain J. Pook, Rev. S. A. Pears, R. Reid, Admiral C. G. Robinson, J. W. Russell, E. H. Rickards, Major B. Rogers, W. J. Rideout, J. C. Sim, H. H. Thomas, F. Tuckett, Rev. T. S. Turnbull, Admiral Ward, Captain the Hon. F. Walpole, and Dr. G. Webster.

ADMIRALTY SURVEYS.*—Steadily progressing in the two-fold object of charting shores imperfectly known, and delineating with

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* By the Hydrographer, Captain F. J. O. Evans, R.N., C.B., F.R.S.

greater accuracy (in the interests of commerce) the approaches to and the anchorages of better-known regions, the Marine Surveys undertaken by the Admiralty still deserve permanent record in the Annual Address from the President.

Passing from our own shores, surveys of a permanent character are being carried on in parts of the Gulf of St. Lawrence, Newfoundland, Labrador, Jamaica, and Mauritius. Also on the East Coast of Africa—for the security of our cruisers engaged in suppression of the slave traffic—on the shores of Japan, and in the several Australian Colonies of Queensland, Victoria, South Australia, and West Australia; together with the recently-acquired Crown dependency of Fiji.

Surveys of a detached character by trained surveying officers and others have also been made in the Mediterranean, on the coasts of China, and among the islands in the western half of the South Pacific Ocean.

The voyage of the *Challenger*, now on the eve of completion, has also during the past year materially added to our knowledge of the Physical Geography of the Pacific Ocean; the details of which will be given hereafter.

The Arctic Expedition, under Captain Nares, comprised of the screw steam-ships *Alert* and *Discovery*, and accompanied by the paddle-wheel frigate *Valorous*, left our shores late in the month of May last. The two Polar ships, after completing their provisions, fuel, and stores at Disco, in Davis Strait, parted from the *Valorous* and proceeded on their way to Smith Sound. The *Valorous*, returning to England after an absence of thirteen weeks, performed good service on the homeward voyage, by obtaining deep soundings and serial ocean temperatures in Davis Strait and the Atlantic Ocean. Through the laudable zeal of Captain Allen Young, while engaged in an enterprising voyage of exploration in the Arctic seas, the time of arrival at and departure from Carey Islands (near Smith Sound) of the Polar ships was ascertained; and letters buoyant with hopes for their future, received up to the 27th of July, 1875.

There have been thus employed during the past year under the direction of the Admiralty, in exploratory research, three of Her Majesty's ships, with complements of 51 officers, including seven gentlemen of special scientific acquirements, and 305 men; two surveying war-ships, foreign, and one on home service—employing 30 officers and 210 men; six detached surveying parties, foreign

—employing 15 officers in colonial or hired vessels; and two similarly detached for home service—employing 4 officers.

England.—Important changes having taken place in the Solway Firth during late years, both in the direction of the navigable channels and the distribution of the shoal-banks; Staff-Commander Kerr has commenced surveying operations here, and completed the southern or English channel from Wokington to Silloth. A preliminary examination has also been made by this officer of St. Tudwall Road and the approaches to Port Madoc, in Wales; and also a re-examination of Fishguard Bay.

On the south coast, Staff-Commander Hall has completed an elaborate survey of Southampton Water, Cowes roads, and the shoaler ground leading to Spithead therefrom.

On the east coast, Staff-Commander Parsons, in H.M.S. *Porcupine*, has minutely re-surveyed the entrance of the River Humber, extending to some distance above Grimsby:—a general re-disposition of the bed of the river since the Admiralty Survey of 1851 rendered this examination necessary. Advantage was taken during the finer months of the season by this zealous officer to extend his work to the Dogger bank; the Hull Chamber of Commerce having announced their belief in the shoal-ground of that extensive shallow in the North Sea becoming, by lesser depths of water over it, dangerous to shipping. Captain Parsons did not find less water than 7 fathoms; this depth corresponding with the shoal-water found in the surveys made by the late Captains Hewett and Washington, R.N., in the years 1832 and 1842.

Ireland. — The coast-line between Dublin bay and Wicklow Head, with inshore soundings extending to a depth of 10 fathoms, has been examined in detail by Staff-Commander Kerr; thus completing—in continuation of the survey of the outlying shoal-banks made last year—the information necessary for the secure navigation of this district.

Mediterranean.—Thanks to the warm interest taken in Hydrographical research by the Naval Commander-in-Chief (Admiral the Hon. Sir J. R. Drummond, K.C.B.), Staff-Commander Millard was enabled to make, in the months of February and March, 1875, a minute survey of Port Said and its approaches, as also—with the assistance of the officers of H.M.S. *Torch*—a series of current observations on the littoral between that Port and the Damietta mouth of the Nile. This officer's able survey and report failed to show

any very marked heaping-up or accumulation of Nile deposit or sand-drift outside the western breakwater of Port Said, such as might have been expected in the time that had elapsed from the survey made in the spring of 1873; more especially as there had been a very high Nile in 1874. It was, however, evident that a slow but certain shallowing of the water obtained, as the 27, 30, and 32 feet contour-lines were seaward of those before surveyed. The bottom was invariably sand and mud of a stiff clayey nature. At a depth of 27 feet the sand was in excess, increasing as the water shoaled; at depths exceeding 33 feet mud alone was found. The dispersion or levelling of the oozy mud found northward and westward of the west breakwater during former surveys was probably due to the winter westerly gales, which prevailed before Staff-Commander Millard commenced his examination.

The season of the year prevented more than a cursory examination of the currents along the adjacent coast. So far as this extended, the conclusions drawn were:—1. That the wind mainly influences the current. 2. That the prevailing wind is north-west. 3. That the prevailing current is easterly, or from the Damietta mouth towards Port Said. 4. The line of strongest current is that bordering on the Damietta mouth of the Nile and the projecting coast east of Port Said. 5. The current is retarded and diverted by winds contrary to its course, and wholly reversed by strong easterly winds, or a continuation of light easterly winds. 6. The sand-drift of the coast between Ghemil and Port Said is always to the eastward, or towards the western breakwater.

The coast-line between the Damietta mouth and Port Said was also by this survey found to have extended considerably seaward since that made by Captain Mansell, R.N., in 1856; in some places nearly to the extent of three-quarters of a mile. Permanent beach marks were, on Staff-Commander Millard's suggestion, erected by the Egyptian Government, in order, by future surveys, to test accurately the conditions and rate of extension of this particular coast district.

Staff-Commander Millard is now engaged in re-sounding the upper part of the Grand Harbour at Malta, there being evidence of a slow silting up in parts. As these soundings will be referred to a fixed datum-mark, exact comparisons of changes in progress can be made in the future.

East Coast of Africa.—Excellent work on this trying coast, notwithstanding occasional sickness and adverse weather, has been

performed by the commander, officers, and crew of the *Nassau*; and a detailed survey completed of the coast-line and dangers to the edge of soundings between Cape Delgado and Shanga Island, in lat. 11° 52′ s. Towards the close of 1875 it was necessary to remove the ship to the Cape of Good Hope, mainly to recruit the health of the crew, and also to refit. Calling *en route* at Port Mozambique, her commander, Lieutenant F. J. Gray, accompanied by our Consul there, in the interests of navigation, effected the ascent of the neighbouring Table mountain in order accurately to determine its position; this elevated land forming a valuable mark from seaward, where the currents run strong. A few days after return from this brief expedition, and before the ship had reached a temperate region, the commander quickly succumbed to the effects of African climate. The Royal Navy has lost in Commander Gray a noble officer (the commission promoting him was on its way to the ship before the account of his death reached the Admiralty). Transferred from the Navigating to the Executive line of officers for acts of bravery and cool self-possession when on a former surveying expedition in the Sulu Sea, he endeared himself to all with whom he was associated, not only for his social qualities and gentleness of manners, but also for his professional abilities and well-tempered zeal.

The *Nassau*, under a new commander, R. J. Napier, who has seen good surveying-service, is now on her voyage to China to assume work in that sea.

Japan.—Captain St. John, and the officers of H.M.S. *Sylvia*, have performed good service on the shores of Nipon and Sikok. The Straits of Simonoseki and Isumi, forming the extreme eastern and western entrances of the Inland Sea; as also the entrance to Owari bay and the coast between Mura and Owasi bays have been surveyed on commensurate scales.

Japanese officers are also making useful hydrographic surveys, principally of harbours not heretofore correctly charted on the coasts of the greater islands; and also among the off-lying groups to the south-westward—notably at Oösima Island and the Meiaco Sima group; many of these surveys are published by the Japan Admiralty in a form useful for European navigators. Some of the native officers engaged in this meritorious work received instruction originally in our own surveying ships.

Corea.—As a brief episode in the *Sylvia's* Japan survey, Captain St. John was directed in August last to make a cursory examina-

tion of the south-east coast. Leaving Tsau-liang-hai, or Chosan harbour, on the 25th, the ship entered Douglas Inlet and found a magnificent basin to exist, formed by the mainland of Corea on the north and west, and a large island, named Cargodo, studded with small islets on the south and east. The *Sylvia* anchored off a village situated under a remarkable cone-shaped mountain on the island, from the summit of which a good view of this spacious basin was obtained. The unconcealed unfriendly, and, indeed, hostile, demonstrations of the many officials and natives met with in the brief stay of the party in this neighbourhood, induced Captain St. John to return to Nagasaki, as it was hopeless to proceed in the examination of the coast without using force—a measure obviously undesirable. The *Sylvia* is now, in all probability, engaged in an examination of the ship-channels among the many groups off the south-west coast of Corea, and in the line of sea-communication between the northern ports of China and Japan.

Newfoundland and Labrador.—The survey of these shores under Staff-Commander Maxwell steadily progresses. During the early and late portions of the past season, the east side of Placentia Bay and the main channels were completed—a real boon in aid of telegraphic communication, as convenient places for the landing of cables are now charted.

On the Labrador shores the coast-line survey has been fairly completed to Halton harbour, the northernmost fixed settlement of the Newfoundland fishermen. From that port northward to Nain (a Moravian Missionary settlement), a distance of nearly 200 miles, the coast has been explored, sketches made on the track followed, and the principal headlands fixed by astronomical observations. The examination of this region was both arduous and difficult, the vast number of off-lying islands embarrassing the surveyors, and, further, the field-ice remained on the coast till the last week in August.

Jamaica.—The minute examination of the south shore of this fine West India island still progresses, and the small surveying party in a sailing schooner, under Lieutenant T. F. Pullen, is steadily working westward between Milk and Black rivers. The coast between Milk River and Helshire point, embracing that fine sheet of water, Portland Bight, with its many anchorages, is in the hands of the engraver. Staff-Commander George Stanley, who had charge of the survey up to September last, was then compelled from ill-health to return to England; his able assistant, Navigating-

Lieutenant Hoskyn, unhappily fell a victim to yellow fever in the previous month.

Western Australia.—Staff-Commander Archdeacon and party have completed the survey of the coast-line from Swan River northward to the 28th parallel, or just beyond Port Gregory. This stretch of coast is described as most barren and inhospitable, fringed with outlying reefs and sunken rocks, in some places extending seven miles from the shore; fresh-water scarce and hardly drinkable. The only places of shelter for vessels in this district, nearly 300 miles in extent, are Champion and Jurien Bays, the latter only available for a small class of vessels, and even for them difficult of access. Port Gregory is alone a boat-harbour; it has, nevertheless, for some years been the outlet for the produce of the Geraldine and other metalliferous mines in the neighbourhood. Being unsafe in winter, it will probably be abandoned as a shipping port when the railway in progress from Champion Bay to the mines is completed.

The surveying force is now working its way from Swan River to Cape Leeuwin and King George Sound. The coast region south of Geographe Bay is little known, and good results will follow this examination.

South Australia.—The examination of the coast and off-lying islands and soundings between Cape Catastrophe and Streaky Bay still progresses under Staff-Commander Howard. One of his assistants, at the request of the Colonial Government, has made an elaborate survey of Port Pirie, in Spencer Gulf, and had also commenced for engineering purposes, in the interests of the colony, a survey of the sea-mouth of the Murray River.

Victoria.—The survey of Banks Strait, referred to in the Address of last year, is in progress. The necessity of this examination is shown by several new dangers presenting themselves. Exceptionally bad weather in the surveying season prevailed; a feature that was observed generally throughout the Australian colonies. Hobson Bay (the chief port of Victoria) has also been surveyed in minute detail to meet projected harbour-improvements.

Queensland.—The survey for the past year has been confined to the sounding out the region bounded on the north by the line between West Hill and the Percy Isles, and the several approaches to Broad Sound. Numerous and extensive shoals exist here, and the survey has disclosed that great care is necessary in navigating these waters. The great range of tide at Broad Sound—over 30 feet—and the rich character of the adjacent country, point to

this district as one of great value in the future maritime interests of the colony.

Fiji Islands.—This group having recently become a colonial dependency, Lieutenant Dawson, after the completion of the charts of North-East New Guinea, made in H.M.S. *Basilisk*, Captain Moresby, and referred to in the Address of last year, was detached with a small party and a steam-launch to the South coast of Viti Levu. A detailed plan of the Suva bay and the adjacent neighbourhood, on a large scale, has been completed, in anticipation of the seat of Government being removed from its present position in Levuka to this, or some more suitable site. Lieutenant Dawson has recently, from ill-health and exposure, been compelled to resign the charge of the survey.

Deep-Sea Exploring Expedition.—The *Challenger's* labours are now drawing to a close, and within a few days her arrival in England may be expected; thus terminating a voyage which, for the wideness of its scope in the field of terrestrial physical research, and the solidity, and—it may be, indeed, fairly said—brilliancy of the results, has not been excelled in any preceding generation. At this time last year the *Challenger* was engaged in the Inland Sea of Japan, after having been refitted and docked at the Japanese Government port of Yokoska. The dredging and trawling operations in the Inland Sea produced little of interest to the naturalists, and time pressing, Japan was finally quitted on the 16th of June; the deep-sea soundings previously made from the Admiralty Islands north of New Guinea being now connected with the South coast of Oösima.

From Yokohama a section between the 35th and 38th parallels of latitude was run to the 156th meridian of west longitude (the deepest water found being 3980 fathoms), from whence the course was shaped direct for the Sandwich Islands (the deepest water on the latter section 3025 fathoms). The sea-bottom level at the great depths of these sections of the North Pacific Ocean is throughout very uniform, composed of red clay, with manganese and pumice, the latter much increasing as the Sandwich Islands were approached.

Honolulu was reached on the 27th of July. Leaving Honolulu on the 11th of August, deep soundings were taken (2050 fathoms) between Oahu and Hawaii, and four days were spent at the anchorage of Hilo, in the latter island, to afford the scientific observers the opportunity of visiting the crater of Kilanea, where

magnetic observations were made, and a series of photographic views taken. Quitting Hilo on the 19th of August, a course was shaped for Tahiti, which was reached on the 18th of September. Of eighteen soundings taken on this section, the deepest was 3000 fathoms, with an average depth throughout of 2500 fathoms. Leaving Papeete in Tahiti on the 3rd of October, the *Challenger* proceeded southward, and reached the parallel of 40° s. in 133° w.; the deepest sounding obtained—2600 fathoms—being at this turning-point: the course was now changed for Valparaiso. Juan Fernandez lying in the track, it was decided to visit that island, and Cumberland bay was reached on the 13th of November; two days were spent here by the Naturalists in making such collections as the time afforded; on the 19th of November the ship anchored at Valparaiso.

Combining from the able reports of Professor Wyville Thomson and Staff-Commander Tizard the results obtained in the central and eastern parts of the Pacific Ocean in 1875, with those made in 1874 in the western part; our knowledge of the physics of this wide expanse of waters is seen to be greatly extended. The general distribution of the sea-temperatures—an important feature on climatic and other grounds—admits of being thus briefly described:—The whole mass of water may be considered as divided into two layers—the upper comparatively superficial, and rapidly cooling from the surface downwards, the lower of incomparably greater amount, extending to the bed of the ocean, and of nearly the same temperature throughout.

These general features will be apparent by the following classification of the maximum and minimum temperatures (Fahrenheit) observed from the surface downwards.

	Maximum Temperature observed.		Minimum Temperature observed.	
	N. Pacific.	S. Pacific.	N. Pacific.	S. Pacific.
Surface	83°·8	84°·0	64°·2	52°·5
50 fathoms' depth	82·8	82·4	53·5	49·4
100 ,, ...	78·8	73·8	50·0	47·8
200 ,, ...	60·0	60·6	45·3	43·3
400 ,, ...	44·0	45·4	38·0	40·0
700 ,, ...	38·9	39·6	36·0	37·1
1000 ,, ...	36·7	36·8	34·8	35·5
1500 ,, and all depths below ..	35·0	35·0	34·0	34·4

The isothermal line of 40° thus indicates nearly the dividing limit between these two layers, and, as a general rule, oscillates between the 400 and 500 fathoms depths. Above this line the distribution of temperatures is apparently regulated by causes affecting the sea-surface temperatures. The temperature of the underlying mass is, according to Professor Thomson, derived from another source, and its distribution governed by other laws. In his report from Valparaiso, dated 5th December, 1875, it is stated:—"The depth of the Pacific increases slowly from the south to the north, the mean difference between the depth of the South Pacific and that of the North being, perhaps, as much as 1000 fathoms.* Notwithstanding this increase in depth, we have satisfied ourselves, although the determination is one of great difficulty, that the bottom-temperature rises slightly from the south northwards. We can scarcely say more than that it rises slightly, for the differences in the temperatures below 1500 fathoms are so small that a result can only be arrived at by a careful combination and comparison of many observations."

"We can scarcely doubt that, like the similar mass of cold bottom-water in the Atlantic, the bottom-water of the Pacific is an extremely slow indraught from the Southern Sea. That it is moving, and moving from a cold source, is evident from the fact that it is much colder than the mean winter temperature of the area which it occupies, and colder than the mean temperature of the crust of the earth; that it is moving in one mass from the southwards is shown by the uniformity of its conditions, by the gradual rise of the bottom-temperatures to the northward, and by the fact that there is no adequate northern source of such a body of water, Behring Strait being only 40 fathoms deep, and a considerable part of that area being occupied by a warm current from the Pacific into the Arctic Sea, and by our knowledge from observations that one or two trifling currents from the Sea of Okotsk and the

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* The annexed abstract of the sounding operations in the Pacific Ocean is interesting, as bearing on this general statement of the comparative depths of the north and south divisions.

NORTH PACIFIC.

Greatest depths 4575 fathoms 11° 24′ N., 143° 16′ E.
" 3950 " 35 16 N., 144 8 E.

Soundings above 4000 fathoms ..	1	in No.
" from 4000 to 3500 fathoms	2	"
" from 3500 to 3000 "	4	"
" from 3000 to 2500 "	25	"
" from 2500 to 2000 "	12	"
" from 2000 to 1675 "	3	"

SOUTH PACIFIC.

Greatest depth 2750 fathoms 7° 25′ S. 152° 15′ W.

Soundings above 2700 fathoms ..	1	in No.
" from 2700 to 2500 fathoms	8	"
" from 2500 to 2000 "	18	"
" from 2000 to 1500 "	9	"
" from 1500 to 1350 "	3	"

Behring sea, which are readily detected and localized, and are quite independent of the main mass of cold water, represent the only Arctic influx. During its progress northwards the upper portion of the mass becomes slightly raised in temperature by mixture with, and possibly by slow conduction from, the upper layers which are affected by solar heat."

"I am every day more fully satisfied that this influx of cold water into the Pacific and Atlantic Oceans from the southward is to be referred to the simplest and most obvious of all causes, the excess of evaporation over precipitation of the land-hemisphere; and the excess of precipitation over evaporation in the middle and southern part of the water-hemisphere."

"After what I have already said, I need scarcely add that I have never seen, whether in the Atlantic, the Southern Sea, or the Pacific, the slightest ground for supposing that such a thing exists as a general vertical circulation of the water of the ocean depending upon differences of specific gravity."

The Equatorial current was found, in accordance with the experience of former navigators, to occupy the region of the trade-winds, *i.e.* approximately from 20° N. to 20° S.; as was also the narrow, but strong, counter-current setting to the eastward between the parallels of 9° and 5° N. On the passage from Honolulu to Tahiti, when in 7° N., this counter-current was found to be running at the rate of 50 miles a-day, with a surface-temperature of 80° to 82°. In 1° N., the south branch of the Equatorial or west-going current was running at the great rate of 70 miles a-day, with the surface-temperature at 77°.

Several observations for velocity and temperature were made in the Japan stream, or Kuro Siwo. In June a current of 3 knots an hour was found on the 138th meridian, between 32½° and 33½° N., with varying surface-temperatures from 63° to 68°, the rate of the stream not being affected by the changes from cold to warm water. These peculiar effects are probably not found to the eastward of 140° E., and there, apparently, the stream is a warm one.

The course of the Japan stream is much the same as that of the Gulf-stream, and due to the same cause. The Equatorial current, or rather its northern branch, striking against the Philippine group, and other islands of the Eastern Archipelago, is diverted to the north, but in a less permanent and defined manner than the Equatorial current is in the Atlantic by the unbroken American con-

tinent. Nevertheless, the stream passes the southern coasts of Japan apparently as a permanent current, exercising a perceptible thermic influence to a depth of at least 300 fathoms. The influence of the Japan stream itself on the temperature of the ocean, as compared with the Gulf-stream, is, however, much sooner reduced and obliterated.

Reverting to the Pacific Equatorial current, its warm waters, instead of being closed up by the form of the land-barrier, as in the Atlantic, spreads out in the Middle and Western Pacific Ocean in a vast sheet of abnormally warm water, extending to a depth of nearly 100 fathoms.

On the nature of the bottom of the Pacific Ocean and its fauna, Professor Wyville Thomson describes the former in that great extent between Japan and the Sandwich Islands as uniform, being of red clay, containing a large proportion of the tests of siliceous organisms, and a considerable quantity of pumice in different states of comminution and decomposition. The clay was found to contain scarcely a trace of carbonate of lime, although the surface swarmed with ooze-forming foraminifera. Over the whole area the red clay was full of concretions, consisting mainly of peroxide of manganese, varying in size from a grain of mustard-seed to a large potato. When these concretions are broken, they are found to consist of concentric layers, and usually starting from a nucleus consisting of some foreign body, such as a piece of pumice, a shark's tooth, or a fragment of any organism. The concretions appear to form loose among the soft clay, and the singularity is striking both of the amount of this manganese formation and the vast area which it covers. The fauna of the North Pacific at depths of from 2000 to 3000 fathoms, although not abundant in species, was by no means meagre; and the naturalists were again struck with the wonderful uniformity of the fauna at these depths. If not exactly the same species, very similar representatives of the same genera occur in all parts of the world.

Between the Sandwich Islands and Tahiti, and from Tahiti in a meridional direction to the parallel of 40° s., the bottom is described as consisting mainly of red clay, except in the neighbourhood of the groups of volcanic islands, where it was found to be largely composed of volcanic débris and shore-mud, containing occasionally an admixture of the decaying shells of foraminifera, and at nearly all the soundings a large proportion of the manganese concretions, from the size of a nut to that of an orange, and passing into fine,

almost microscopic granules, were observed. The bottom fauna over the whole of the manganese area is meagre, both as to number of species and number of individuals. Its scope and extent was, however, scarcely fairly tested, as the presence of manganese nodules was almost fatal to the working of the trawl, from their weight bringing a destructive strain on the line, or tearing away the trawl-bags. The trawling between Juan Fernandez and Valparaiso was especially interesting. Animal forms were much more abundant than they usually are in the Pacific, their general character resembling in a remarkable degree the fauna of the Southern Sea in the neighbourhood of the Crozet and Kergulen islands, many of the species being identical. Professor Thomson remarks on this trawling-station, "Notwithstanding the considerable depth of 2225 fathoms, the conditions in this locality seem much more favourable to animal life than even the manganese area; and I am inclined to think that we had struck upon one of the highways by which migration takes place to the northward from the Southern Sea."

Leaving Valparaiso on 10th of December—the sectional soundings and serial temperatures extending to Juan Fernandez having been completed—the *Challenger* proceeded to the southward, still prosecuting the Ocean work, and anchored on the last evening of the old year at Port Otway, in the Gulf of Peñas. On New Year's Day Messier Channel was entered, and on the 20th of January the Strait of Magellan was cleared, and Port Stanley, Falkland Islands, reached on the 23rd. At several of the anchorages taken up in Messier, Smyth, and Sarmiento channels, as also in Magellan Straits, exploring parties in aid of zoological and botanical science were detached, while from the ship the usual sounding and trawling operations were sedulously carried out. During the fortnight spent at Falkland Islands the ship moved to Port Louis, in order to obtain corresponding tidal and magnetical observations on the exact site of those made by Ross (1842) during his Antarctic voyage in H.M.S. *Erebus* and *Terror*. The tidal observations were of some immediate interest, as information had reached the Admiralty through the Colonial Office that the island authorities were impressed with the belief of a gradual elevation of the group being now in action: these tidal observations, however, indicated that the mean sea-level was in exact accordance with that determined by Ross thirty-three years previously (May to September, 1842), and duly recorded by him on a permanent rock-

tablet. The magnetical observations, as in the time of Ross, show that great secular changes still exist; the easterly declination or variation of the compass decreasing at the rate of 5·3 minutes, and the inclination, or dip of the needle, decreasing at the rate of nearly 8 minutes annually.

On the 16th of February, the *Challenger* arrived at Monte Video, from whence she sailed a few days afterwards to complete sectional oceanic observations across to Tristan d'Acunha. We have subsequently heard of her arrival at Ascension and the Cape de Verd islands; the ship may now be daily expected to arrive in England to be paid off at Sheerness.

Summary.—The demands of commerce and its rapid expansion, even in unlooked-for regions, have been met by increased activity in the Hydrographic departments of most Maritime States, and the interchange of nautical information by the medium of brief published notices has now become general. The translation of, the re-editing, charting, and issuing this daily-received new matter in the usual form of Notices to Mariners, requires unremitting attention and well-skilled labour to utilise in the interests of British shipping.

Five volumes of Sailing Directions, embracing the North Sea, West Coast of England, West Indies, and Western Africa have been revised and published during the year; as also a Supplement to the 'China Sea Directory,' containing sailing directions for Malacca Strait, compiled and published.

In the Chart branch, 72 new charts have been published, involving the cancelling of 50 sheets; while 175,000 charts have been printed for the general public and for the use of the Royal Navy.

Arctic Regions.—Since my remarks at the opening of the present Session little has occurred relative to our Arctic Expedition which it is necessary here to record. The *Alert* and *Discovery* were last seen by European eyes on the 17th of July last, when they disappeared from the view of the spectators on board the *Valorous* in Waigat Strait, near Disco. Many of you have doubtless read the interesting account of the last days of the Expedition in Danish Greenland, written by our Secretary, Mr. Markham, which has since appeared in the first part of our 'Proceedings' for the Session. It is well known, also, that later letters were received, through the agency of Captain Allen Young, announcing the well-being of

the officers and crews up to the 27th of July. We have now only to buoy ourselves with the hope that favourable news of the Expedition may arrive in the autumn, on the return of Captain Allen Young in the *Pandora*, who has been commissioned by the Admiralty to visit, during his summer's Arctic cruise, the islands at the entrance to Smith Sound, in the hope of finding letters deposited there in the spring by sledge parties sent down by Captain Nares. The *Pandora* leaves England in the course of a few days, and we shall all be on the tiptoe of expectation for the news she may bring on her return.

With regard to other Arctic undertakings, I have only to record that the Swedish voyage to the mouths of the Yenisei and the Obi last summer having proved successful, Professor Nordenskiöld is preparing for another cruise this summer to the same regions. He is to leave Gothenburg in a steamer on the 10th of July. Simultaneously with his Expedition we hear that several Russian steamers will make the reverse voyage, that is from the Yenisei to St. Petersburg, *viâ* the Kara Sea, North Sea, and the Baltic.

Iceland.—The journey of Mr. W. L. Watts across the Vatna Jökull, and the publication of Captain Burton's 'Ultima Thule, or a Summer in Iceland,' are events this year in the geographical and topographical history of this northern island, which it is necessary here to record. The successful passage of the previously untrodden Vatna ice-mountain in the south-eastern part of the island was, in the words of the veteran Arctic traveller Dr. Rae, one of the most daring journeys that it was possible to accomplish. It had been attempted the previous summer (1874) by Mr. Watts and a party of young Englishmen, but the excessive cold and the deadly snow-drifts drove back the expedition. In the summer of 1875 he tried again, accompanied by a number of hardy Icelanders, and succeeded this time in getting across to the northern side. Although by this feat Mr. Watts added but little to our geographical knowledge, his investigation of the imperfectly known volcanic region on the northern side of the Vatna enabled him to rectify to a considerable extent existing maps, especially with regard to the course of the Jökulsà. His geological observations were more numerous and important; according to him the Vatna Jökull is a mass of ice and snow, resting upon a nest of volcanoes, and rising to a height of nearly 7000 feet. Captain Burton's two handsome

volumes form a complete monograph of this interesting island; the well-known encyclopædic tastes and acquirements of the author enabling him, in addition to the narrative of his journey, to bring together a mass of information regarding the Physical Geography, products, and inhabitants of Iceland, which he has arranged and classified in a manner convenient for purposes of reference.

Russia.—In the course of the past year eight important Expeditions, under the auspices of the Russian Geographical Society, have been undertaken, continued, or brought to a conclusion.

The idea of the first of these, namely, that charged with carrying a series of levels across Siberia, was originated in 1872, when the academician, H. J. Wild, submitted his proposal to the joint sections of Mathematical and Physical Geography for the equipment of an expedition for this purpose. He had in view the importance of determining the absolute heights of a few positions in the northern part of the continent of Asia, so as to correct, with some degree of certainty, the barometrical measurements for altitudes in different parts of Siberia and the neighbouring countries. Although the proposal met with considerable favour and sympathy in both sections, and in the council of the Society itself, its fulfilment was deferred for want of the necessary funds. Upon the termination of the Aralo-Caspian levelling-operations, however, the instruments employed on that occasion became available for other purposes, and a sufficient sum of money having been accumulated to allow of the carrying of one line of levels for a distance of 2000 miles as far as Irkutsk, it was determined to proceed with the work and to place it under the control of Colonel Tillo, whose survey of the Ust Urt between the Aral and Caspian Seas was noticed in the last Annual Address. The whole distance was divided into five sections, to each of which a separate surveyor was assigned, the work being commenced simultaneously at several points. By the end of last year a distance of about 170 miles to Irkutsk remained unfinished, and this will probably be completed in the course of this summer, when the results will be published.

The second Expedition, that to the Olónek, to which attention has been called in the Addresses of former occasions, has now, in its third year, been brought to a conclusion. Chekanoffsky, who had previously successfully accomplished two scientific Expeditions to the lower Lena and the *tundras* on the Olonek, has now supplemented these by further researches. Leaving

Irkutsk in the month of May last, he descended the Lena by water, accompanied by only one assistant, returning to that place late in December. Delayed in their progress down the river by the continual winds which marked the summer of 1875 in those regions, and anxious to visit the great northern *tundra*, the explorers left the Lena at Aiakit (17 miles below Bulun) and crossed by land to the Olonek, following its course to its embouchure in the Northern Ocean, where they arrived on the 26th of August. The extreme limit of their journey was Cape Krestoffsky (Cap de la Croix), whence they turned homewards. Returning to Bulun they were obliged to wait for the freezing of the rivers and the return of the inhabitants to their winter quarters. The great *tundra*, which they thoroughly examined, appears to be essentially different from that of Western Siberia. Favoured by a mild autumn and a warm temperature, vegetation was in full vigour as late as the 3rd and even the 15th of September, and although cold weather set in soon afterwards, it was not of long duration, and on the 26th of September, in 71° 30′ N. lat., they remarked insects, belonging to the order *Neuroptera*, flying about.

Chekanoffsky brings home his geognostic and route surveys, and a journal kept during his journey from Yakutsk to the mouth of the Olonek; besides a palæontological collection, comprising 1600 specimens, all of which belong to the secondary geological epoch; an herbarium containing upwards of 3000 plants; and an entomological collection numbering upwards of 7000 insects.

The Amu Daria Expedition is the third of those alluded to, and during the course of the year Messrs. Barbot de Marny, Smirnoff, and Sévertseff have personally communicated, at meetings of the Russian Geographical Society, the principal results of their observations, notices of which have appeared in the Geographical Magazines at home and on the continent. The literature of this subject has also received an important addition in Major Herbert Wood's work, mentioned in another part of this Address, 'The Shores of Lake Aral.' It only remains to say a few words on the meteorological observations which have been steadily continued since the establishment, by M. Dorandt, of an observatory at Nukus and a subsidiary station at Petro-Alexandroffsk. At both of these hourly observations have been made during a year (from October 1874 to October 1875) on the temperature, density, and humidity of the air, direction and force of the wind, clouds, declination of the magnet, solar heat, measurements of the internal

temperature of the earth at various depths, and of aqueous evaporation. Dorandt further ascertained the relative positions of the following places: Kazalinsk, Nukus, Petro-Alexandroffsk, Chimbai, Khiva, Hodjeili, Kungrad, Kushkanatau, Ak-kala, Klytch-kala, and Irghiz, besides making 167 observations for time, 19 for latitude, and 176 for terrestrial magnetism.

In February 1875, as soon as the ice on the Amu-daria was sufficiently strong to bear, accurate surveys were made of the river, and the velocity of its current was determined. These observations were further verified in July of the same year by the Aral flotilla.

The extreme dryness of the atmosphere in these regions during the summer months afforded an admirable opportunity for testing the scientific instruments employed; experiments were accordingly made with the psychrometer of Auguste, and these again compared with the hydrometers of Saussure and Renaud. In this way a foundation has been laid for the study of the physical geography of Central Asia, which may hereafter produce important results.

Mr. Miklukho-Maklay's travels in the Malayan Region, under the auspices of the St. Petersburg Society, have been continued. He passed nearly the whole of last year on the peninsula of Malacca for the purpose of pursuing his ethnological studies, which promise to be interesting.

Another of these enterprises is the Expedition to the Ket and Chulim Rivers. M. Sidensner, at the instigation of the Minister of Public Works, visited last summer the water-communications of Western Siberia, with the view of ascertaining the practicability of uniting the great river-systems of the Obi and Yenissei. He found that the Ket, an important tributary of the Obi, offered the greatest facilities for the accomplishment of this undertaking; while his colleague, M. Lopatin, explored the geology of the basin of the Chulim, where he found iron ore. His researches further resulted in the discovery of animal and vegetable fossil-deposits in several places on this river.

An important step in the exploration of the unknown territory of Central Asia has been made by the Hissar Expedition. The party, commanded by M. Mayef, an accomplished ethnologist and statistician, and assisted by a staff of trained observers, a diplomatic agent, and an escort of Cossacks, set out from Karshi (the summer residence of the Khan of Bokhara), and took the road to Baisun, passing the Chakcha valley, and the gorge famous under the name of the "Iron Gate," situated not far from Darband.

This place had not been seen by European travellers since Don Ruy Gonzales de Clavijo's embassy to the Court of Tamerlane. They visited the town of Hissar, in the highland valley of the Surkhan and Faizabad,* in that of the Kafirnihan—both right tributaries of the Oxus. Thence they proceeded to the valley of the Surkhab, one of the four chief contributaries of the Upper Oxus, the source of which was discovered by Fedchenko to be in the Alai Mountains, where it is known under the name of the Kizil-su (meaning the same as Surkh-ab, *i.e.* red water). Here they were enabled to verify the information collected by Fedchenko, which proves to be very accurate. They proceeded up the last-named river, through a narrow gorge, in which the path follows along dangerous precipices, and crossed the Surkh-ab by the famous Pul-i-Sangin (the Stone Bridge). It should be mentioned that the river is here known as the Wakhsh-ab (a form which has been often compared with the Greek Oxus), although further north it bears the name of Surkh-ab. It is extremely to be regretted that the illness of several of the party, owing to the unhealthiness of the climate, prevented them from advancing, as they had intended, to the point of confluence of the Wakhsh and the Panj, in order to fix it astronomically, and obliged them to return to Shahar-sebz, which they reached on the 13th of June, after having spent forty days in traversing the territories of Hissar and Kul-ab. The maps of this Expedition will be of great interest.

In the extreme west of the great desert of Central Asia another expedition, organised by the Caucasus section of the Russian Geographical Society, has explored and mapped the remaining unsurveyed portion of the Usboi, or old bed of the Oxus, between Bala-Ishen and Lake Sara-kamish. From their report it appears that the river-bed is well marked throughout its course between banks 140 feet high, with a stony bottom, encrusted in places with salt, and here and there covered with vegetation chiefly consisting of saxaul. The channel presents no serious obstacles to the uninterrupted flow of a river. The presence of this Russian reconnoitring detachment is said to have exercised so beneficial an effect on the country, that four caravans of merchandise were dispatched from Krasnovodsk to Khiva (eighteen days' march), an event which has not occurred for ten or fifteen years.

* This must not be confounded with the capital of Badakshan, to the south of the Oxus.

The return of Mr. Sosnoffski, already well known as a Central Asian traveller, from China, completes our list. His expedition was undertaken by orders of the Government with the object of opening new outlets for the Russian trade with Asia, as well as for obtaining precise information on the insurrection of the Dungans, and the resources at the disposal of the Chinese Government to repress them. The party, consisting of MM. Sosnofski and Matusofski, Dr. Piassitsky, M. Boiarsky, and a Chinaman long resident at Kiakhta, and representing one of the principal tea houses of that place, proceeded viâ Kiakhta to Pekin; thence to Hankow, where they arrived in October 1875. Leaving this place, they ascended the Han-kiang, which waters the provinces of Hu-peh and Shen-si, and is easily navigable for steamers. They continued their journey to the Russian frontier in the Altai, passing through Han-chung-fu, Hami (Khamul), Barkul, and Guchen (Kuchun)—a distance of about 2800 miles, of which 800 were accomplished by water. They have made a number of observations; brought back collections of plants and animals, besides specimens of Chinese art and industry; and taken photographs of the various types of inhabitants and the buildings and monuments.

The coming season promises to be one of unusual interest to Russian geographers in regard to Arctic enterprise. In co-operation with Nordenskiöld's expedition already mentioned, it is rumoured that four steamers will leave Tobolsk in autumn, and descend the Ob to the Sea of Kara; and that a scientific expedition will proceed overland to the Gulf of Obi. What the results of these enterprises may be it is impossible to foretell. But this, at all events, we know for certain, that Messrs. Finsch and Brehm, and Count Waldburg-Zeil, of the Bremen *Polar Verein*, have started for Western Siberia, with the intention first of exploring the Altai Mountains, in the neighbourhood of Semipalatinsk, and thence, travelling northwards to the country near the mouth of the Ob, by the high road through Barnaoul and Kolivan, gaining the Upper Obi at Tomsk.

Two new expeditions to Mongolia are spoken of; and the indefatigable traveller, Prejevalsky is on the point of starting for Lob-nor, whence he may possibly try and penetrate to Lhassa.

India.—*Trans-Himalayan Surveys.*—The recent publication of Captain H. Trotter's Report on the Trans-Himalayan Explorations by employés of the Great Trigonometrical Survey of India during the years 1873–5, has been a great gain to Geography, containing as it

does an account of three very important journeys performed through unknown, or very little known, portions of Central Asia. The route of Colonel Montgomerie's havildar, to which I gave a prominent place in my November Address, has now been published "in extenso," as the first Memoir of this series, and fully justifies the expectations that were formed of it. The havildar's exploration, indeed, of the northern bend of the Oxus, was not arrested, it now appears, at Kileh Khumb, the capital of Western Darwáz, as had been previously stated; but he succeeded in penetrating 60 miles further up the river to the village of Yaz-Gholam, on the immediate frontier of Shignan, thus leaving an interval of only one day's march between his survey from the west, and that of Abdul Subhan from the east. His observation also of the lower course of the Wakhsh or Surkháb, and his determination of the positions of Kuláb and Baljewán to the north, and of Kurghán-teppeh and Kobádián to the south, are of the utmost value to a true understanding of this interesting region, and entitle him to the thanks of all Geographers. Captain Trotter, I may add, has utilised all the new material that has been thus obtained in a map recently published, which for the first time exhibits in a correct form the natural features of the narrow belt of country now alone intervening between the Russian frontier at Kokand and the Afghan frontier on the Oxus.

The Moolah's journey, which is described in Captain Trotter's second Paper, is also of much value in supplementing our previously scanty knowledge of the upper portion of the Chitral Valley, a line of route to which I drew particular attention ten years ago as the natural high road of commerce between India and Central Asia. His description of the Biroghil Pass, which was first brought to our notice by Md. Amín, and has been since visited by Captain Biddulph, is of especial interest in showing that wheeled carriages can cross without difficulty from the basin of the Oxus into a valley leading to the Cabul River, and ultimately to the Indus, so that the passes of the Hindú-kúsh are no longer of any account in considering the approaches to India from the north.

Captain Trotter's third Memoir, which describes the route over entirely new ground, in Thibet, of the famous Pundit, now introduced to us for the first time under his true name of Nain Singh, is of such peculiar interest that I propose to give a *résumé* of the journey, as it appears in the introduction to the Trans-Himlayan Report.

"Leaving Leh in the disguise of a Láma or Buddhist priest,

Nain Singh was successfully smuggled across the frontier, and succeeded in making his way from Noh to Lhása by an entirely new route which emerges to the north of Lhása on the Tingri Nur or Námcho Lake, the successful exploration of which by another Pundit in 1872 has been recently described. From Lhása the Pundit returned to India by a southerly route, following for a few miles the Brahmapútra, in a hitherto unsurveyed portion of its course, at a distance of about 40 miles east of Lhása. By taking bearings to peaks, beyond which the great river was said to flow, he succeeded in fixing its course approximately for another 100 miles to the east. He traversed the Thibetan district of Jawang, and emerged in British territory at Odalguri in the Darrang District of Assam, having made a very careful route-survey over almost entirely new ground for a distance of more than 1200 miles. Excellent astronomical observations were made at various points throughout his journey, and the quality of the work has proved itself first-rate. The difference in longitude between Lhása and Odálguri (whose position has been fixed by the Indian Survey), being little more than one degree, we are enabled to obtain a new value of the longitude of Lhása, which ought to supersede all former determinations derived from routes, all of which lie for considerable distances in nearly the same latitude. Hypsometrical observations for calculation of height above the sea-level were taken throughout his route, which materially increases the value of the newly-obtained geographical information."

Topographical Surveys—The Naga Hills.—In the Naga Hills, Captain Badgley and Lieutenant Woodthorpe, and the other assistants of No. 6 Topographical Party, have been for the last two seasons of 1873–74 and 1874–75, doing excellent work. The course of the Lanier has been surveyed, and that stream proved to drain into the Irawadi instead of the Brahmaputra basin, as hitherto supposed, and a large extent of country, before quite unknown, has been filled into the map of the north-east frontier. In January 1875, the party, with the political agent, Captain Holcombe, was treacherously attacked and eighty-one men massacred by the Nagas of Ninú, that officer being the first to be cut down. Captain Badgley had a most narrow escape, being severely wounded; fortunately he got to his revolver in time, and thus saved his life. He collected the remnants of the party together, and by his example and courage led them safely out of the hills,

although repeatedly attacked on the line of march by the Nagas, who were greatly excited and flushed with the success of their attack, but who gave up the pursuit with loss. On the more western side Captain Butler, the political agent of the Naga Hills, with Lieutenant Woodthorpe, had similar difficulties to encounter. They were attacked at Wokha late one evening; fortunately the sentries were well on the alert, and the neighbouring village was instantly taken and burnt. The official reports giving the area completed have not yet been sent in; but it is in topography and triangulation very considerable. Mr. Ogle completed a large portion of Munipur territory, and connected the triangulation, which had been carried over for 80 miles in the season of 1872–73 by Major Godwin-Austen from Samaguting to Munipur, with the Great Trigonometrical Survey series at Cachar, its most eastern limit. This was a most laborious piece of work, and kept him and his party in the field until the commencement of the rains, a most trying time for such work.

During the last field season, 1875–76, the operations were again taken up in the Naga Hills, near Wokha. Again the party, shortly after starting for their ground, were attacked on the line of march by the Nagas, and that gallant officer, Captain Butler, received a spear-wound, from which he died on the 7th of January last. He took a zealous interest in the work of exploration, and his loss will be severely felt by the Survey Department, whose operations he had forwarded to the very best of his ability. By every one who knew him in Assam his loss is much deplored. Lieutenant Woodthorpe has been continuing the work, but has been impeded not a little by the unfriendly feeling some of the clans display.

In the Naga Hills south of Sibsagar some excellent topographical work has been turned out by Captain Samuells, of the Revenue Survey, who was accompanied during the field season of 1873–74 by Captain Holcombe, as political officer, and whose unfortunate death I have mentioned above.

The Dufla Expedition.—The Expedition on the North-East frontier during the winter of 1874-5, to release captives taken by the Duflas, afforded an opportunity of exploring and mapping a large area of country before unvisited and unknown. The charge of the Survey operations was given to Major H. H. Godwin-Austen, assisted by Lieutenant H. J. Harman, R.E., and Messrs. M. J. Ogle, and W. Robert. A great number of peaks had in previous seasons

been fixed by Mr. W. Beverley,* which proved of great use. The country is one dense forest to the summits of all the ranges, up to 9500 feet, and the only method of making a reliable map was to clear peaks at intervals, and in commanding positions, from whence the country could be overlooked; it was, therefore, found very little extra labour to carry on a regular system of triangulation at the same time with the topography. This triangulation was carried from a base of the G. T. Series on the Brahmaputra, near Dunsiri Mukh, up to our farthest point 42 miles distant, where from two stations at about 7000 feet a fine panorama of the snowy range was obtained, stretching for 120 miles from the snowy peaks E, G, and H, north of Tezpur, in a direction E.N.E. towards the great bend of the Brahmaputra. Many peaks upon ridges bounding the great valley of the Subansiri, or Lopra Kachu of D'Anville's map, were secured, and the run of its course within the hills laid down. The country to the north here was seen to be much more open, the hills grassy with patches of forest as in the northern parts of Bhutan. The total area covered by triangulation was about 2500 square miles; six peaks were cleared, and nine stations observed from, the most northern peaks fixed lying near lat. 28° 15′. The total area of topography was about 1550 square miles, of which 450 was completed on the scale of 2 miles = 1 inch, the remainder on 4 miles = 1 inch; this area comprises the whole drainage of the Dikrang, Burroi, and Ranga rivers.

The work entailed a good deal of hard climbing and exposure, as in January the cold was severe on ranges of 7000 to 8000 feet; and a good deal of snow fell in January, when on Torúpútú Peak, which was felt much by men of the native establishment, the amount of clothing they could carry on the Expedition being very limited. Progress was much impeded by the incessant rain during January. The Duflas having early in February given up all our captured subjects, the Government of India determined to withdraw the whole of the force at once, and thus a grand opportunity was lost of penetrating to the higher ranges overlooking the Subansiri, an undertaking then not so very difficult to have carried out, after so large a force had entered the country, and with all supplies ready to hand; it will be many many years before so favourable an opportunity occurs again.

An account of the Geology of the Dufla Hills, by the officer in

* Then in charge of the Assam series of the Great Trigonometrical Survey.

charge of the Survey Party, has been published in the 'Journal of the Asiatic Society of Bengal for 1875.'

New Geographical Works relating to Asia.—So many new books of voyages and travels relating to Asiatic countries have been recently published in England, testifying to the increased and ever-increasing interest which is taken by the public in these subjects, that my Address on the progress of Geography would be incomplete if I did not briefly allude to them.

Firstly, then, I would draw attention to the handsome quarto printed by the Indian Government, which contains all the official reports on scientific subjects submitted by the members of Sir Douglas Forsyth's Mission to Kashgar. Colonel Gordon and Dr. Bellew, who were attached to the Mission, have also furnished descriptive narratives of the journey, which very agreeably supplement the more serious volume.

Mr. Markham's 'Thibet,' although primarily devoted to the narratives of the little-known journeys of Bogle and Manning to Teshu-Lumbo, and Lhasa, contains a vast amount of information, collected from other sources, regarding the Geography of the Trans-Himalayan plateau. This information, indeed, is so complete and well arranged as far as it goes, that it is all the more to be regretted the report of the famous Pundit, describing his important route from Lhasa direct to Assam, from which the identity of the Tsanpu River with the Brahmaputra has been all but demonstratively proved, did not arrive in time to be incorporated in Mr. Markham's digest of authorities.

Another Asiatic work which possesses much interest for Geographers at the present time is Dr. Anderson's narrative of the two late expeditions across the Burmese frontier into China. The book, which is entitled 'Mandalay to Momein,' commences with Sladen's march in 1868, and continues the account of Colonel Horace Browne's proceedings up to the date of Margary's murder, in February, 1875. A very important supplement to this work is supplied by our own 'Proceedings' on the 14th of February last, when Mr. Margary's Journal from Hankow to Sha-ch'iao, already published in China, having been read to the Meeting, Dr. Anderson, from private letters furnished by the ill-fated traveller's family, was able to continue the narrative of his march through Tali-fu and Momein, and across to the frontier to Bhamo. On a later occasion, it may also be remembered, a Paper, by Mr. Ney Elias, was read to

the Society, which minutely described a new tract of country to the south of Major Sladen's route, through which an easier and more direct road led from Bhamo to Momein. It is to be hoped that during the investigation into the Manwyne outrage of last year, which Mr. Grosvenor is understood to be now conducting upon the spot where it occurred, occasion may be found to complete our knowledge of the Geography of this most interesting region, through which in times past a very flourishing trade was carried on between India and China, and which may be expected in the future again to become a highway of commerce.

Among other recent works upon the East, of which the Geographical value has been already brought before this Society by anticipation, I would notice, firstly, Major Herbert Wood's volume on the Aralo-Caspian basin, which, in its scientific portion, is a mere amplification of the admirable Memoir published in our own 'Journal;' and, secondly, Colonel Baker's 'Clouds in the East,' where the author's travels along the rarely-visited Turcoman frontier of Persia, to which I drew attention in my last year's Address, are described with much vigour and clearness of detail. But by far the most important of all such publications is Mr. D. Morgan's translation of Colonel Prejevalski's travels in Mongolia, which, having had the good fortune to be annotated throughout by Colonel Yule, whose services we have, happily, this year secured for our Council, will henceforward be our standard authority for the Geography of the Eastern portion of Central Asia.

New Guinea.—The past year has been remarkable for the activity displayed in New Guinea exploration—no fewer than three of our Evening Meetings this Session having been occupied by the reading and discussion of Papers relating to recent discoveries in the south-eastern part of this great island. Some of the increased activity is, no doubt, a result of the promising field of exploration opened up the year previous by the coast-surveys of Captain Moresby, in the *Basilisk*, an account of which was given in my last year's Address; but the principal discoveries have been due to the ability and enterprise of the Rev. S. Macfarlane, of the London Missionary Society, who, in the search for new stations for the New Guinea Mission established by the Society before the voyage of the *Basilisk*, has succeeded in penetrating with the steamer *Ellengowan* two of the large rivers which debouche on the southern coast. The first of these

explorations, in order of time, was the ascent of the Mai Kassa, or Baxter River, the mouth of which lies behind the small island of Boigu, and nearly opposite the Cape York promontory of Australia. Mr. Macfarlane states that he received information of the existence of a navigable river in this direction, from the natives of Boigu; but I believe the credit of first discovering the river is due to Lieutenant E. R. Connor, R.N., who surveyed this part of Torres Straits, on behalf of the Queensland Government, in 1873; for I find on one of his charts, published at Brisbane in the same year, the mouth of the river very clearly marked under the name of "Mai Cussar." Mr. Macfarlane ascended the stream to a distance of 90 miles, but found that only the lower course for a distance of 60 miles was navigable by his steamer. We are indebted for an account of this first successful attempt to ascend a New Guinea river to our young Associate, Mr. Octavius Stone, who, being at Cape York at the time Mr. Macfarlane was preparing for his voyage, accepted the invitation of the latter gentleman to accompany the Expedition. It is interesting to find, from the descriptions given both by Mr. Stone and Mr. Macfarlane, that the country improved in appearance, and in the variety and beauty of its vegetable and animal productions, the farther they penetrated into the interior; the tract of land through which the lower and broader part of the river meandered being level and monotonous in its aspect. Similar observations were made on the next river-voyage of Mr. Macfarlane, namely, that up the great river called the Fly, a little farther eastward. The *Ellengowan* ascended this stream in December last to a distance of 160 miles, anchoring at the turning-point in 17 fathoms of water, without reaching the undulating or hilly country of the interior. It would seem, therefore, that the whole of the coast-land in this part of New Guinea partakes of the nature of a Delta formation, consisting of broad level tracts traversed for scores of miles by salt or brackish water creeks, into which, far in the interior, the rivers proper discharge themselves. On his ascent of the Fly River, Mr. Macfarlane had as passenger Signor D'Albertis, the experienced Italian Naturalist, whose observations, read at our last Evening Meeting, on the country, the native tribes, and the animal productions, are most interesting and valuable. Besides adding to our knowledge of these subjects, Signor D'Albertis has rendered good service in finally disposing of the fabled existence of large quadrupeds and birds in this part of New Guinea—the rumoured

colossal bird, of which some accounts were published a few months ago, turning out to be a hornbill of ordinary size; and the traces of a supposed rhinoceros proving to be those of the New Guinea cassowary. The banks of the lower part of the Fly River—as the boating-parties of the surveying ships *Fly* and *Rattlesnake* had found, to their disappointment, thirty years ago—are thickly inhabited by native tribes of a most warlike and courageous disposition. Mr. Macfarlane had great difficulty in avoiding a sanguinary encounter with these daring savages; but he appears, by a judicious display of force when needed, and by peaceful overtures on other occasions, to have at last gained their good-will. It is doubtful if the branch ascended by Mr. Macfarlane be really that of the principal stream discharging into the Delta channels of this part of New Guinea; its course lay much too far to the west for the great river which is supposed to descend from the interior in this direction, the course of which is more likely to be from the north-west.

Whilst Mr. Macfarlane was exploring the Fly River, Mr. Stone had engaged at Cape York the two practical Naturalists left there by the Macleay Expedition, and proceeded to Port Moresby, much farther to the east, with the intention of crossing the Eastern Peninsula of New Guinea. He did not succeed in his main object, for want of means of transport, which, he reports, must be either Timor ponies or South Sea Islanders. The natives proved unwilling to act as carriers, although they offered no obstacle to his penetrating by land some 20 miles into the interior. In this part of New Guinea the great mountain-range of the interior approaches within a moderate distance of the coast; and Mr. Stone's twenty miles' march brought him to the lower hills which lie at the foot of Mount Owen Stanley, as far as at present known, the highest peak of the range. Mr. Stone found the interior much more luxuriantly wooded and more fertile than the coast-country, and the hill-tribes of natives different in disposition and manners from the maritime tribes. I need not particularize further the information he gives, inasmuch as it will all in due time be in the hands of the Fellows with the next volume of the Society's 'Journal.' The copious details with which we have been furnished by Mr. Stone regarding the country and natives of the Port Moresby region, added to those of Signor D'Albertis, respecting Yule Island and the Fly River, form a large addition to our knowledge of this hitherto almost unexplored land. They supplement, to an important

degree, the valuable record of his discoveries which Captain Moresby has lately given to the world in his work on 'New Guinea and Polynesia.'

As an addendum to this brief account of New Guinea exploration, I may venture here to mention a new work that has recently appeared, which contains a most valuable and reliable account of many of the islands of the Western Pacific, some of which were also visited and described in Captain Moresby's book alluded to above. I mean, the 'Journals of Commodore Goodenough, during his last Command on the Australian Station.' I have already, in the Obituary, given a brief notice of the last cruises of this gifted and much-respected naval commander.

AUSTRALIA.—Our Council, as you are already aware, has rewarded with one of the Royal Medals of the year, the skill and perseverance of Mr. John Forrest, whose successful journey was fully narrated in the 'Proceedings' of our last Session. I have now to record that another traveller has succeeded in traversing the great desert of West Central Australia; thus making the third who has accomplished this exceedingly difficult task. The traveller to whom I allude is Mr. Ernest Giles, who may almost be said to be the pioneer in this latest and most arduous field of Australian exploration, he having preceded both Colonel Warburton and Forrest in these attempts to penetrate the great unknown region lying between the line of overland telegraph and the shores of Western Australia. On that first Expedition, in 1872, he reached a point 300 miles to the west of the telegraph line; and in a subsequent attempt, along nearly the same parallel, he succeeded in advancing double that distance, but was then forced to return by the death of his companion and the invincible difficulties of the country. His third undertaking, much to the south of the previous journeys, has been more successful. Furnished with camels and a complete equipment by the liberality of the Hon. T. Elder, the same constant friend of Australian exploration who fitted out the Expedition of Warburton, he left Beltana, a station to the east of Lake Torrens, on the 6th of May, 1875, and reached Perth on the 18th of November of the same year. The line of march through nearly the whole of the unexplored district lay along the thirtieth parallel of south latitude, therefore about 240 miles south of Forrest's route, and 480 miles south of that of Warburton. The region traversed, though lying in a more temperate latitude, and at no great distance from the southern

shores of the continent, proved just as desolate and waterless as the lines of country traversed by the two other travellers just mentioned. Mr. Giles, in summing up the results of his journey, states that throughout the 2500 miles he travelled no areas of country available for settlement were found. The general character of the country was that of a slightly undulating desert, clothed, however, for hundreds of miles at a stretch with a scrub of low trees and bushes, chiefly belonging to the *Leguminosæ* order, which grows so densely that it was often impossible to get a view of the surrounding country. At rare intervals, rock holes containing a moderate supply of water were found; but in the central part of the journey the interval between these reservoirs was no less than 325 miles, and in many parts chains of dried-up salt-lakes added to the desolation of the scene and the difficulties of the march. Without camels such a journey would have been no doubt impossible.

A journey of so great an extent, through a country so barren and difficult, could have been carried out only by an explorer of great courage and determination, and full of resources. Mr. Giles has shown himself to be an able leader, and has well earned the success which will place him in the same category of Australian travellers to which belong Sturt, Eyre, Stuart, Warburton, and Forrest. He appears to have been well seconded by his subordinates, Mr. Jess Young and Mr. Tietkens, the former of whom has been recently amongst us. This Expedition, confirming in its results those of Forrest and Warburton, will probably set at rest the question of the capability for settlement of the interior of Western Australia, and close the era of Australian Exploration on the large scale, although much yet remains to be done in completing the examination of districts intervening between the routes of the greater Expeditions.

North America.—*United States.*—Important additions to our Geographical knowledge of the Western Territories of the American Union have been again made this year by the Geological and Geographical Survey parties, under the energetic superintendence of Professor F. V. Hayden. Among the many beautifully-executed maps issued by this Department have been one of the Sources of the Snake River, including the Yellowstone National Park, on a scale of one inch to 5 miles, and another, embracing portions of the Montana and Wyoming Territories, which present striking effects in cartography—the one from a skilful use of contour-lines to represent inequalities of surface, and others from the brown tinting of the

hills, printed from chalk drawings. Some of these maps have been issued in two forms, one of them coloured geologically. Four sheets of an Atlas of Colorado have also appeared during the year. Public attention in England has lately been drawn to these regions, especially the Yellowstone, by the publication of the interesting work by Lord Dunraven, called 'The Great Divide,' a narrative of travels in the Upper Yellowstone.

The amount of topographical and geological work accomplished by Professor Hayden's Department is quite equal to that of any previous year, although the areas of exploration were much further removed from the base of supplies, 24,900 square miles having been surveyed in the three districts into which the work is divided. The results of this survey have been issued in the shape of bulletins, as a more prompt medium of publication; and a volume of 500 pages, with many plates and maps, has been completed, in which the physical geography, geology, zoology (extinct and existing), and ethnology of the district are discussed: some 200 pages of a second volume having also come to hand. Six "miscellaneous publications" have also been issued, comprising valuable meteorological observations, lists of elevations, a 'Synopsis of the Flora,' &c. (including an exhaustive work of 800 pages on the 'Ornithology of the Region drained by the Missouri and its tributaries'). The wonderful extinct vertebrata of the cretaceous formations of the West are described by Professor Cope, in a 4to volume of 300 pages, with 57 plates, also issued by this Survey.

Much material of interest, both as regards Topography and Physical Geography, is to be found in Mr. G. C. Broadhead's recently received 'Report of the Geological Survey of the State of Missouri,' published in 1874, and illustrated by many plates and a separate atlas.

The Topographical Department of the United States, under General Humphreys and Lieutenant Wheeler, of the Engineer Corps, has also performed good work during the past year. It has issued the first eight sheets of a Topographical Atlas, projected to illustrate Geographical Explorations and Surveys west of the 100th meridian of longitude; the maps being on a scale of 8 miles to the inch. A useful appendix to this is an Index Map showing the routes of Exploring Expeditions and the areas that have been surveyed west of the Mississippi. When this Atlas is completed it will form a most valuable addition to the cartography of the Western States and Territories. We hear that the work of Triangulation of

the Northern and North-Western lakes is now being carried on under the direction of Brigadier-General C. B. Comstock. It has been already carried round the south end of Lake Michigan.

I may mention also, as a work indispensable to the Geographer and Statist, the new Statistical Atlas of the United States, which we have recently received from America. It is an exhaustive work by Professor Walker, Superintendent of the 9th Census of the States, containing a vast mass of accurate information under the heads of Physical Features; Population; Social and Industrial Statistics and Vital Statistics. Sixty maps and diagrams illustrate the important Report, and furnish clear views of the River Systems of the country; the areas of woodland; the distribution of rain, temperature, storms, and so forth, besides the more purely social phenomena, such as the Density of Population and its migration during the present century.

We learn from our Honorary Corresponding Member, Professor J. D. Whitney, State Geologist for California, that the work of this important Survey, which has yielded in past years such valuable results in Geography as well as Geology, is suspended, and that he doubts if it will be resumed. Of the four sheets of the Central California Map (scale 6 miles to an inch), two are finished and the others in progress; but no more Geological Maps will be issued, and the stones from which they were printed will probably be destroyed. Professor Whitney has brought out a new edition of his 'Guide Book to the Yosemite Valley,' in which a good many changes and additions have been made and a new map inserted. Mr. Whitney has also published an interesting historical essay on 'Geographical and Geological Surveys' (Cambridge, 1875), and some valuable contributions to barometric hypsometry.

Mr. W. H. Dall's determinations of heights on the north-west coast, in connection with the Coast Survey; the military survey of the Black Hills of Dakota and Wyoming, under Colonel Dodge; and Professor Thompson's exploration of the Colorado River, under the direction of the Smithsonian Institution, also deserve notice. The local authorities of the State of New York have published two works of geographical interest; one on the boundaries of the State, the other (with many maps) on the Topographical Survey of the Adirondack Wilderness. The topography and physical resources of this State have also been ably discussed by General E. L. Viele, in an address to the American Geographical Society. Lastly, the minor features of the maritime provinces, middle States,

and New England, are exhaustively treated and illustrated by maps —somewhat after the plan of our own 'Murray,' in Osgood's series of Handbooks.

The North-American Boundary Line.—The Geographical information gathered by the Officers of the British Boundary Commission, under Major Cameron, R.A., during their Survey of the Frontier Line between our Possessions and the United States, formed the subject of a Paper which was read to the Society, in March last, by Captain S. Anderson, R.E., a member of the Commission. The party met the Commission appointed by the United States at Red River, and commenced their joint operations in September 1872. Beginning with the Lake of the Woods, the line surveyed extended to the Rocky Mountains and completed the work of the similar Expeditions under Captain Palliser and Dr. Hector, which explored the North-West Territory in the years from 1857 to 1860. In the course of their operations the party had to traverse, often for weeks in succession, treacherous swamps, dense pine-forests, and stretches of desert country, clearing and making the boundary-line through every obstacle. The description given by Captain Anderson of the configuration and varied nature of the region examined has added very considerably to our knowledge of the Topography and Physical Geography of this part of North-America.

SOUTH AMERICA.—The first volume of the general work on the Geography and Products of Peru, by our Honorary Corresponding Member Don Antonio Raimondy, which was mentioned in the Address of 1874 as being in preparation, has now been published, and fully justifies the anticipations indulged in with regard to it. This fine work promises to be a complete geographical monograph relating to this varied region, and it is to be hoped that means will not fail for its successful completion. We have received also from Peru, direct from the President of the Republic, a volume entitled 'Demarcacion Politica del Peru,' which will be of the greatest possible utility to all who are engaged in studies connected with the political boundaries of the various divisions of that country.

Two interesting journeys of exploration have been recently performed by young English engineers in Brazil, accounts of both of which, communicated by the authors, will shortly appear in the 'Journal' or 'Proceedings' of the Society. One of these journeys, by Mr. James W. Wells, extended from the middle course of the

River St. Francisco to the Tocantins, and thence back to the Atlantic shores at Maranham. The other, by Mr. T. P. Bigg-Wither, was an exploration of the little-known River Tibagy, a tributary of the Paraná, in the interior of Southern Brazil. Both papers supply a large amount of most welcome information regarding the Topography and the Physical Geography of parts of this vast empire. Another exploration, of still greater novelty and extent, is one by Mr. Alfred Simson, up the River Iça, or Putumayo, a tributary of the Upper Amazons. Mr. Simson is said to have navigated this almost unknown stream for a distance of 1000 miles, but we have not yet received definite accounts of his exploit. These, as we are assured, will be furnished to us as soon as they reach England.

Africa.—In Africa, and especially in Equatorial Africa, has been centered the chief geographical interest of the year. When I delivered my last Anniversary Address to you in this hall I drew your attention to the grave—not to say perilous—position of the two adventurous travellers, Mr. Stanley and Lieutenant Cameron, of whom nothing had been heard for many months, but who were believed to be pushing their way into regions of the most inaccessible and inhospitable character. With regard to Lieutenant Cameron I may now confess that I felt more anxiety than I cared to express, knowing as I did that he was trying to force a passage through the savage tribes who line the lower course of the Congo, and feeling assured that he would persist in his attempt to reach the western sea-coast, appalled by no dangers, recoiling before no difficulties. Mr. Stanley's temporary disappearance did not excite the same amount of uneasiness, since his track lay in a less remote portion of the continent, and he was better equipped for the emergencies of travel; but still the absence of all intelligence regarding him was becoming painful, when in the autumn of last year tidings were received, almost simultaneously, from Egypt and Zanzibar, that the gallant explorer had reached the Court of M'tesa at Uganda, on the north-western shore of the Victoria Nyanza. As a full report of his travels after leaving the sea-coast has been already published in the 'Proceedings' of this Society, I need not at present follow his footsteps in any detail; but in the interests of Geography, and in recognition of his eminent personal services, it is only just and proper that I should briefly notice the main features of his journey. Mr. Stanley then, by taking a new line to the lake,

considerably to the east of the track pursued by former travellers, discovered a considerable river flowing in a north-western direction, which he followed down to the lake along a course which he approximately estimated at 350 miles. This river is named the Shimeeyu, and, as far as our present means of information extend, it must be considered the true source of the Nile, that is, it is the most southerly feeder of the great reservoir of Victoria Nyanza, from which the White Nile issues. After reaching the southern shore of the lake, not far from the Jordans Nullah of Speke, Mr. Stanley put together the Thames boat which he had brought in pieces from Zanzibar, and to which he gave the name of *Lady Alice*, and proceeded to circumnavigate this great inland sea. He passed along the eastern and northern shores of the lake to M'tesa's capital in Uganda, taking a series of observations for latitude and longitude as he went along, and also obtaining measurements both of the depth of the lake and of its elevation above the sea-level. On the whole, Stanley's surveys may be held to confirm in a remarkable manner not only the accuracy of Speke's own work, but the correctness of the information which he obtained from the natives. The lake was found to consist of one great and continuous body of water, instead of being broken into a series of lagoons as had been surmised by other travellers. Its general contour, indeed, as delineated by Speke, and the area which it was estimated to cover, very nearly corresponded with the shape and dimensions given in Stanley's map, and even in regard to the so-called subsidiary lake, named the Bahr-ingo, at the north-eastern corner, which Speke was held to have introduced into his map on insufficient authority, Stanley was able to identify the title in the same locality; and indeed he explained the original report by showing that there really were large land-locked bays in that quarter, almost claiming to be independent lakes. The only serious discrepancy between the two accounts was a difference of latitude amounting in the north to 14 miles, which was due no doubt to some error either of instrument or observation. The elevation of this great reservoir above the sea may be now definitely taken at about 3800 feet, and the depth was ascertained by Mr. Stanley at a point near the eastern shore to be 275 feet. Mr. Stanley sent three letters to England, two viâ Zanzibar and one by the hand of M. Linant de Bellefonds, who was afterwards killed by the Baris near Gondokoro; but we are still without his description of the south-western shores of the lake—between the Kitangúlé river and

Jordans Nullah of Speke—which he proposed to examine on a second excursion from his camp at Kagehyi, to which he had returned from M'tesa's capital. With regard to Mr. Stanley's subsequent movements we are entirely in the dark. It may be assumed from some of his letters that his first object, after completing his survey of the Victoria Nyanza, would be to cross over to the other great Nile reservoir, named by Baker the Albert Nyanza, where an equally large extent of virgin territory awaited his exploration; but it is also to be inferred from the important statement, with which his last letter of May 15 concludes, of his being about to enter on a tramp of 3000 miles, that he must contemplate the further prodigious feat of striking south-west from the Nile basin and opening a way to the western sea-coast between the lines of the Congo and Ogowé. In the case of any ordinary traveller to attempt a march of such extraordinary difficulty through an entirely unknown country, and without any previous arrangement for relief and support, would be pronounced to be an act of almost culpable temerity, but Mr. Stanley possesses such very exceptional qualifications in his fertility of resource, his vigour both of mind and body, and the unlimited command of funds which he derives from his munificent patrons in London and New York, that his success hardly seems beyond the reach of reasonable expectation. At any rate, as a twelvemonth has now elapsed since Mr. Stanley quitted the shores of the Victoria Nyanza, intelligence must very shortly reach us, either through Colonel Gordon or by Zanzibar, of the further course of his African travels; and his friends may rest assured that if success should attend his steps, nowhere will that success be hailed with greater satisfaction than in this country and in this Society, where his discovery and relief of Livingstone are still remembered with mingled feelings of admiration and gratitude.

I now proceed to notice what may well be termed the crowning Geographical exploit of the year. At the date of my last Anniversary Address, all that was positively heard of Lieutenant Cameron's movements was that he had left Ujiji a year previously, with the avowed intention of tracing the course of the stream called the Lukuga, which he believed to be the outlet whereby Lake Tanganyika discharged its waters into the Lualaba. It was further surmised, however, that, having reached the Lualaba, he would endeavour to solve the problem which had been left unsettled by Livingstone, as to the lower course of that river, and its identity either with the Congo or Ogowé; and I felt bound accordingly to

point out the extreme peril and difficulty of such an enterprise, though I did not think it necessary to discourage hope, or to enlarge on the aggravated anxiety he must endure from knowing that the funds of the Relief Expedition were exhausted, and that he had no authority to draw on the Society for any further sums. Now that there is no longer any cause for reticence, I may say that I think it reflects very creditably on Lieutenant Cameron's moral courage that at this juncture, feeling that there was a great opportunity, not for mere personal distinction, but for achieving results of real national importance, he struck boldly forwards, taking all responsibility on himself, and trusting to a generous public to support his efforts in the cause of discovery.

It is already known that when the Relief Expedition came to an end, Cameron's private friends subscribed a sum of nearly a thousand pounds to meet the expenses of his further Exploration, and that to the fund, thus constituted, the Geographical Society presented two contributions of 500*l.* and 1000*l.* respectively; and I may here add, that over and above these advances, with some assistance from the public, and especially from His Majesty the King of the Belgians, who contributed to the Cameron Exploration fund a sum of 200*l.* from his private purse, we have since met all demands for the maintenance and expenses of the Expedition, and the conveyance of the escort from Loanda to their homes at Zanzibar.

But it will be of more general interest that I should now briefly follow Lieutenant Cameron's footsteps from Tanganyika westward. Finding himself unable to persuade his men to accompany him in his projected tour along the banks of the Lukuga, which stream, however, according to the consentient testimony of the natives, was declared to fall into the Lualaba below Lake Moero, or at a point not greatly depressed below the level of the Lake, he turned to the north-west, and passing through the swamps and forests of Manyuema, reached the commercial mart of Nyangwé in the early autumn of 1874.

At Nyangwé commenced that series of important results which have made Lieutenant Cameron's Expedition memorable in the annals of Geographical enterprise. A liberal supply of instruments had been furnished to Lieutenant Cameron by our Society on his original deputation to Africa, but many of these instruments had been damaged and rendered useless by the accidents of travel on his passage from the sea-coast to the interior; and it was therefore most fortunate in the interests of science that, on meeting Dr.

Livingstone's party at Unyanyembé, he was able to reinforce his surveying apparatus from the Doctor's stores. The chronometer especially, which had been presented by the Society to Dr. Livingstone in 1856, in recognition of his early services to Geography, and which, although out of order, had enabled the Doctor to observe, with more or less accuracy, throughout his last journey, was thus transferred to Lieutenant Cameron's care, and it is on this instrument that all the latter officer's calculations for longitude from Tanganyika to the Western Coast are based. A sextant, together with some barometers and boiling-point thermometers, were at the same time taken charge of by Lieutenant Cameron, whose obligations to his illustrious predecessor we are thus proud to acknowledge. Lieutenant Cameron's first care was to determine the correct astronomical position of Nyangwé as a starting-point for further exploration. In continuing his researches he ascertained that the Lualaba from this point inclined to the west and south, thus turning away from the direction of the Nile Basin; and he likewise obtained valuable information of the junction of a large river from the northward, which seemed to answer to Schweinfurth's Uellé, as well as of the existence of the great Lake Sankorra, somewhat further to the west, through which the Lualaba passed, and where traders wearing a European dress, and supposed by Mr. Monteiro, who was long a resident at the West Coast of Africa, to be half-caste Portuguese from Cassange,* were wont to repair for the purposes of commerce. Lieutenant Cameron was most anxious to proceed westward either upon the stream, or along the immediate banks, of the Lualaba, so as to prove by personal observation its identity with the Congo; but the scruples of his followers, the impossibility of obtaining boats, and the persistent opposition of the natives, defeated his purpose, and he was compelled to turn in the first instance to the south, with a hope that by making a circuit amongst tribes of a more friendly character he might still succeed in striking the great river again at a lower point. In this, however, he was again doomed to disappointment, being threatened, indeed, with the armed resistance of the Western chiefs, who, acting probably under a jealous apprehension of interference with their carrying trade, seemed determined to prevent the exploration of the Lualaba or Congo. Ulti-

* The information furnished to the Society by Mr. Monteiro and Mr. R. Capper with regard to the trade of the West Coast of Africa, will be found in our 'Proceedings,' vol. xx. p. 132; and a reference may also be made to Mr. Monteiro's 'Angola and the River Congo,' p. 139, for further particulars.

mately he was obliged to give up this line of route altogether, and, in company with a half-caste Portuguese trader, to pursue a more southernly track to the sea-coast—a track, however, which, passing up the valley of the Lomamé, the most westernly affluent to the Lualaba of Livingstone's map, led to the discovery of another great water-system, composed of a stream flowing through a series of lakes intermediate between the Lomamé and the more easternly valley which Livingstone had followed up from Lakes Bangweolo and Moero. This new river Cameron believed to be the true Lualaba; and it certainly seems to represent the river of that name which was crossed by the Pombeiros in their passage from the capital of the Muata Yanvo to that of the Cazembé. Having penetrated as far as the 10th degree of south latitude, Cameron then turned to the west, and passing along the watershed between the Congo tributaries and the head streams of the Zambési, arrived in due course, but after the most wearisome delays and troubles of every description, at the Portuguese settlement of Benguela, on the sea-coast. It will be unnecessary in this place to recapitulate in any detail the results of Lieutenant Cameron's remarkable journey, as affecting the interests of the politician, the merchant, and the philanthropist; but I may briefly notice a few of his most important discoveries. First, then, the introduction of the chief Kasongo, who, as the sovereign of Urua, appears to be of at least equal power with the Muata Yanvo and Cazembé, into the triumvirate of Central Africa, is a new fact which cannot fail very materially to influence the diplomatic intercourse of the future. Of not less interest is it to learn, for the first time, that the trade from the East and West coasts of the continent does actually meet on the confines of Urua and Manyuema, the Arab merchants of Zanzibar having commercial dealings with the half-caste Portuguese of Bihé and Cassangé, and the produce of this central region being, according to Lieutenant Cameron's observation, of the most varied and valuable character. But the most useful information probably which has been brought back by Lieutenant Cameron from his travels, and that which at the present time is most likely to command the attention of the public, refers to the slave-trade of the interior of the continent, the inference to be drawn from Lieutenant Cameron's experience being that, until superior inducements for the employment of capital are held out by the introduction of legitimate commerce, it will be in vain to expect that this odious traffic can be suppressed, or even seriously checked, by mere repressive measures on the sea-board.

I have reserved for a separate notice the scientific results of Lieutenant Cameron's journey, because it is these results which especially interest us as Geographers, and which have induced our Council to award to him one of the Gold Medals of the year. Lieutenant Cameron's essential merit is as an observer. Familiar with the use of his instruments—from his former experience as a naval surveyor—and gifted with extraordinary industry and perseverance, he seems to have entered on his African travels with a determination to keep his register and field-books as carefully as if employed on a professional survey; and the result has been that he has furnished us with a series of over 5000 observations for latitude, longitude, and elevation. His diligence, indeed, in observing under varying conditions, so as to reduce all possible error to a minimum, together with the extreme accuracy and skill with which he has used his instruments—as testified by the authorities at Greenwich, who have computed his observations—have elicited our warmest acknowledgments; pointing him out, indeed, as a model to all future travellers whose lot may be cast in the unexplored regions of the earth. The Geographical result of his journey—a result of which this country and this Society may well be proud—has been the construction of a section of elevation across the entire continent of Africa from sea to sea, laid down upon a line between the 4th and 12th degrees of south latitude, of which the protraction has been verified throughout by careful and repeated astronomical observation. I need hardly say that Lieutenant Cameron has received congratulations from almost every country in Europe on the splendid success of his African journey; and that this Society, as the patron and supporter of his work, is proud to be able to participate in his triumphs.

I have but few further observations to offer on African exploration. A remnant of the German Expedition still survives in the person of Dr. Lenz, the Geologist, who was last heard of at Asyuka, an upper village of the Okanda tribe, on the Ogowé River, where he was reported to be detained from want of means to continue his journey. The other members of the Expedition had returned home, but the German African Society are now preparing a new effort, and with good hope of success, seeing that they have engaged this time an experienced and acclimatised African traveller to lead the Expedition into the interior. This gentleman, Mr. Edward Mohr, is known for the successful journey he has recently made from Natal to the Zambesi, regarding which he has published a very interesting

book of Travel, which has been translated into English under the title of 'To the Victoria Falls of the Zambesi.' Mr. Mohr is about to visit England in order to confer with Lieutenant Cameron on the subject of West African Exploration. It is his intention to follow the Congo, as closely as circumstances may admit, from the West Coast to Nyangwé.

In the mean time the famous French Expedition, under the Count di Brazza, strong in numbers and perfect in equipment, has penetrated on its way up the Ogowé; and in spite of an awkward affair, in which a native had been killed by M. Marche, had, up to the last accounts, met with no serious impediment. The Count di Brazza expected, we are told, to reach Lake Tanganyika in three years, and opinion on the coast among those most competent to judge was said to be favourable to the success of the enterprise. We are not in a position here to confirm or to reject this opinion, which, after Lieutenant Cameron's brilliant exploit, can hardly be deemed extravagant; but I may, at any rate, suggest that if the French party do reach a great central lake, it will be the Sankorra of Cameron, rather than the Tanganyika, and may add that the successful accomplishment of such a journey would completely eclipse the glory of our own explorers, inasmuch as the country through which the Count di Brazza would pass from the sea-coast is far more difficult than the region on the eastern side of the continent.

No great additions have been made to our knowledge of the course of the Upper Nile since the opening of the Session when I reviewed the proceedings of Colonel Gordon and his subordinates as far as they were known up to that time. Colonel Gordon, it is true, has since marched in person as far south as Mrooli, beyond the Karuma Falls, and he has established a line of Egyptian posts, extending from Gondokoro to Lake Victoria, which he has officially added to the Khedive's dominions; but in regard to that unvisited portion of the river which intervenes between the Makedo Rapids and the Albert Nyanza, nothing has been added to the information which was gained last year by Lieutenant Chippendall at the Koshi village of Fashero, when he was still 20 or 30 miles distant from the Lake; and it is embarrassing therefore to Geographers to find that Dr. Schweinfurth, in the map which he has drawn up and published at Cairo, in illustration of M. Linant de Bellefond's itinerary between Rejaf and M'tesa's capital of Uganda, has lent the authority of his great name to the hypothesis that the Nile proper does not enter the Albert Nyanza at

all, but merely communicates with that inland-sea through the subsidiary branch which Baker ascended, during his first journey, from Magungo to the Murchison Falls. This view of the hydrography of the Nile, which conducts the main river by an independent channel from the Murchison Falls due north to Chippendall's village of Fashero, cannot at present be positively contradicted; but I must observe that it is not in any way supported by Colonel Gordon's reports, the result of his latest inquiries and observations, which were addressed to myself in February last, and which represent the Nile passing through the north-east corner of the Albert Nyanza very much as it was delineated in Sir S. Baker's original map.

Colonel Gordon has been unable to visit the Lake himself, owing to the more pressing calls on his time and attention arising from the responsibilities of his important command, and he is now about to quit the country on his return to England, leaving Signor Gessi —the only European officer now remaining on his Staff—in charge of the Nyanza flotilla. This flotilla consists of two lifeboats (capable of containing 60 or 70 men each), and one small steamer of 38 tons; all these vessels having been originally taken out by Sir S. Baker, and having been moved in pieces by Colonel Gordon from Gondokoro to Duflé, above the Makedo Rapids, where, according to Colonel Gordon's last letter to myself, dated February 9th, they were being put together by workmen obtained from Khartoum. At the above date, Colonel Gordon says that the two boats would be ready in about ten days to start for the Lake and Magungo, and would be followed in about two months by the steamer.*

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* Since the above was in type I have received, through General Stone (chief of the General Staff at Cairo), news of later date from Colonel Gordon, which have a very important bearing on the question of the direct connection of the Nile with Albert Nyanza. General Stone's letter is as follows:—

"Cairo, 6th May, 1876.

"I have to day received from General Gordon-Pacha a letter under date 15th March, 1876, written at Duflé, on the White Nile, in which he informs me that he has nearly completed his line of posts between Capitza, at Ripon Falls, and Lardo (near Gondokoro) his headquarters.

"He states that his two lifeboats are on Lake Albert, and that his first use of them was that of sending supplies from Duflé to the post at Magungo; that Mr. Gessi was sent with them, having orders to go round the Lake.

"It would seem, then, that General Gordon has finally settled the question as to whether or not the White Nile comes out of Lake Albert, and that affirmatively.

"I give you his own words:—

"'The two lifeboats have gone on the Lake. They first took stores to Magungo. Gessi went with them, and has orders to go round the Lake. . . . I have finished

A few other points require notice. Colonel Gordon had always looked forward to the opening up of a direct communication between Lake Victoria and some port on the Somali coast as of the utmost importance, both in the interests of Egyptian trade, and with a view to the consolidation of the Khedive's rule over Equatorial Africa; and he had suggested as the shortest line for such communication, that the course of the Ozy river, which enters the sea between 2° and 3° south, should be followed from the coast as far as Mount Kenia, between which and the lake the interval was supposed hardly to exceed 100 miles; but in this forecast the claims of the Zanzibar State—which extends along the sea-shore, not merely to the Ozy, but to the Juba, and even still further to the north—were overlooked, and the consequence was, that when the Egyptian authorities proceeded to the execution of the project political complications arose of the most serious character. For the present all forcible measures are suspended, and the actual Egyptian occupation extends no further than Ras Hafún, a short distance south of Cape Gardafui, from whence communication with the Lake-region is impossible; but it may be hoped that the Italian Expedition, under the Marchesi Antinori, which left Europe on the 8th of March last, for the purpose of exploring the Galla country to the south-west of Shoa, may discover some routes leading from Victoria Nyanza to the coast, which may serve as an outlet for the produce of Equatorial Africa, without trenching on the rights of the Sultan of Zanzibar.

The Egyptian conquest of Darfur and Wadai has also given an impetus to exploration in this direction. Independently of the official surveys of the Egyptian Staff, which have been regularly forwarded to this Society by General Stone, under instructions from the Khedive, and which are very creditable to the skill of His Highness's surveyors, at least two private exploring parties are now engaged in extending our Geographical knowledge to the south-west of the Nile basin. Signor Marno is reported to have pushed on through the Bari country towards the Balegga Mountains;* while an enterprising private English traveller, Mr. Lucas, who

plan of river. Fancy, there is only a space of 3 miles in its total length [? up to Albert Nyanza] which is impassable, and that 3 miles is 9 miles north of Duflé.'

"I congratulate the Royal Geographical Society on the fact that one of its Fellows has settled the above interesting question.

"I am, &c.,

"F. M. P. STONE."

* According to later news this traveller has returned to Egypt.

left England in the autumn well-equipped, and thoroughly imbued with the spirit of exploration, writes to me from Khartoum, under date the 11th of February, to the following effect: "I hope to leave this in about a month for the Bahr-el-Gazelle, following Dr. Schweinfurth's route to Munza, and from thence I shall endeavour to find the head-waters of the Congo, by marching due south until I reach the latitude of 3° s., and then altering my direction to the south-west."

Another Expedition which promised well has, I am sorry to say, come to an untimely end. The Catholic Archbishop of Algiers wrote to us in the autumn, that having for many years cultivated relations with the tribes of the Northern Sahara, and established stations amongst them 200 miles beyond the French frontier, he was about to depute three of his best-qualified ecclesiastics to cross the Desert direct to Timbuctoo, partly for missionary purposes, and partly to collect information regarding the country and its inhabitants. We cheerfully awarded him our sympathy, and expressed our interest in the success of the enterprise. Intelligence, however, has just reached England that the three young priests have been all beheaded in the Desert; and their followers plundered and dispersed; a serious blow being thus given to any further attempt at exploration in this quarter.

As a set-off to this tragic event, I may congratulate the Society on the very flourishing condition of the settlement of Livingstonia on Lake Nyassa, where our old Associate, Mr. E. D. Young, is doing good service in the cause of civilisation, and from whence ere long we may expect to receive some valuable additions to our Geographical knowledge. Mr. Young successfully launched his little screw-steamer, *Ilala*, on the waters of this great Lake, so long ago as October last; and the missionary party whom he had in his charge are now settled near the south-west corner of the Lake, at Cape Maclear.* Whilst recording the success, so far, of this undertaking, we must not forget that the credit of its first inception is due to Dr. James Stewart, the old companion of Dr. Livingstone on

* Just as these sheets are passing through the press we have received a letter from Mr. Young, dated February 19th, 1876, in which he announces his successful circumnavigation of the Lake, in the *Ilala*. A most interesting discovery has rewarded his efforts. The lake proves to extend 100 miles further north than Livingstone believed; the converging shores seen by Livingstone's boat-party, and supposed by them to indicate the end of the lake, turning out to be narrows, beyond which this splendid fresh-water sea again expands, and reaches 9° 20′ of south latitude. No bottom was found with 100 fathoms of line; and a long range of mountains, 10,000 to 12,000 feet high, lies along the north-eastern shores.

the Shiré during the Zambesi Expedition. The Established Church of Scotland are now sending out a strong party of men, with a fine sailing-boat, built of steel by Mr. Yarrow, to form a fresh station on the Lake, and the Free Church reinforce this party with new volunteers. A new Expedition has also been organised by Mr. H. B. Cotterill, the son of the present Bishop of Edinburgh, with a view of pushing commercial enterprise from Livingstonia among the tribes along the shores of the Lake, as well as in the interior, and thus introducing the only effective remedy for the slave-trade, namely, legitimate commerce; the gentleman in question, whom we have supplied with a few instruments, is soon about to leave England. He has been furnished, as a gift from his old pupils, the Harrow boys, with a large steel boat for navigating the Lake. He starts under very favourable auspices; and we shall await the results of his travels around Lake Nyassa with interest and hope.

Before concluding these remarks on the subject of Africa, I must say a few words regarding the remarkable journey of Dr. Steere, overland to Lake Nyassa. Desirous of following up Dr. Livingstone's work in this direction, and accompanied by Livingstone's old servant, Chumah, Dr. Steere undertook this journey of some 500 miles on foot, for the purpose of visiting Mataka, the paramount chief of the Waiyero tribe. He landed at Lindy Bay, on the East Coast, and struck across for the Rovuma, reaching Mataka's head-quarters, which he found to lie in the very heart of the great slave preserve of East Africa. In spite of the protestations of the Arab slave-dealers, Mataka expressed a wish to have some of the English to reside among his people, and it is now Bishop Steere's object to establish a Universities' Mission Station at the chief's place.

CONCLUSION.—Gentlemen, I have now brought my Report on the progress of Geography during the past year to an end. The Report is not perhaps quite as comprehensive as usual, owing to various accidental circumstances—such as the non-arrival of intelligence from India, the absence of our Honorary Secretaries, and the pre-occupation of my own time; but it will, I trust, have conveyed to the Fellows a sufficiently clear idea of the vast extension and importance of our favourite science at the present day. Not only, indeed, are Expeditions being organised for exploratory purposes by Governments, by public bodies, and by private individuals, in all quarters of the globe, but new Societies are also springing up, with every indication of strength and vigour, which bear evidence to the

growing demand for Geographical information, and which may each be expected to form in the future a nucleus of intelligent research. The Société Khediviale established at Cairo under the Presidency of Dr. Schweinfurth, has thus already taken a high place among Geographical authorities, and we have been invited within these few days to recognise new institutions at Madrid and Lisbon which promise to revive the glories of the old days of Spanish and Portuguese discovery. That the Royal Geographical Society of London has been mainly instrumental in creating and developing this spirit of research cannot be doubted. We have encouraged the exploration of unknown regions by every means in our power. We have impartially bestowed our medals and rewards wherever Geographical merit came to the front, irrespective of creed or race, and we are now reaping the fruits of our long years of labour,—seeing as we do on the one side the increased attention which, in deference to the feeling of the age, is everywhere paid to Geography in the teaching of the young, and seeing on the other the general respect with which our suggestions and advice are treated, not only by the Government of this country and our great educational establishments, but by public opinion throughout Europe and America. And it may further be of interest to the Fellows of our Society to know that, in view of the recognised importance of the study of Physical Geography, a study which, although clearly within the scope of our operations as defined by our Charter, has been hitherto comparatively neglected, we are now considering—at the instigation of certain members of our Council, General Strachey and Mr. Francis Galton, whose efforts in this direction it is only proper thus publicly to acknowledge—the propriety of instituting special rewards, and even establishing lectures in order to promote the diffusion of knowledge in this branch of Geographical science, and to encourage its more systematic cultivation. Owing to the recent heavy pressure of other business, our consultations on this head have not yet assumed any definite form, but it is probable that the plans will very shortly be matured and duly communicated to the Fellows.

And now, Gentlemen, before I close my Address, I must again remind you of the debt of gratitude which we owe to the Senate of the University of London for their continued liberality in granting us the use of this hall for our Evening Meetings. On all ordinary occasions it amply suffices for our wants. On extraordinary occasions—such as our recent Meeting to welcome Lieutenant Cameron

—no public building in this great metropolis, which is available to our use, is large enough to afford accommodation for the thousands who are entitled to admission. Perhaps in the fulness of time, either through the liberality of the Government, or by the help of some wealthy friends to Geography, who may think the scientific education of the public to be as much an object of national importance as the formation of rich galleries of art, we may be provided with a hall of our own suited to our largest requirements; but in the mean time we thankfully acknowledge the enlightened aid of the University of London, and we must be content on rare occasions to submit to some inconvenience and even disappointment.

Gentlemen, the time is now come when I have to take a formal, and probably a final leave of you. I have been for 32 years a member of this Society; for 20 years, with very few breaks, I have served upon your Council, and I have now presided five times at your Anniversary Meetings. The greater part of my spare time since I returned from the East has thus been devoted to your service, and I am proud to state that my most agreeable memories are associated with the growing prosperity, and what I may now call the assured success, of the Geographical Society. But time steals on; I am not as active in mind or body as I was; and as I find the continued direction of your affairs to be hardly compatible with the discharge of other duties connected with my public office, I am obliged to tender my resignation of the post of President. And I have the less hesitation in now asking for my release, that I am able to transfer my functions into the hands of a gentleman who to great experience in the East, and a good practical acquaintance with its Geography, unites the qualification of a perfect man of business, a scholar, and a diplomatist. In electing Sir Rutherford Alcock to be your President, and in surrounding him with the thoroughly efficient Council whose names appear on the balloting list which has just received your approval, you have obtained the best possible guarantee for the successful management of your affairs during the ensuing year. I shall always be glad myself to give any advice or assistance that may be required, and I trust that the whole body of Fellows, in our common interest, will accord to the Council as at present constituted their fullest confidence and support.

PAPERS READ

BEFORE THE

ROYAL GEOGRAPHICAL SOCIETY

DURING THE SESSION 1875-76.

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I.—*Journey across the Vatna Jökull, in the Summer of* 1875.

By W. L. Watts.

[*Read*, November 15th, 1876.]

It is a remarkable fact, that although this island is not more than 400 miles from our own shores, it contains no less than from 3000 to 4000 square miles, until recently untrodden by the foot of man. I refer to the Vatna Jökull, and a much larger area to the north of it which had never been investigated. It was to this district that my work this year was principally confined, and it is to the Jökulls, or ice mountains of Iceland, its fjalls, or mountains destitute of any frozen covering, together with the hitherto uninvestigated districts to the north of the Vatna Jökull, that our attention will this evening be directed.

It has been a matter of surprise to me that although we have extended our researches to most of the principal mountain-chains of the world, the grand Jökulls of Iceland, with volcanic fire still smouldering beneath their icy surface, should be left in their frozen solitudes to be visited only by the fog and the storm, and that we should possess no definite account of those volcanic wildernesses which lie immediately to the north of Vatna Jökull.

Concerning this district the wildest stories have been current tradition has handed down the supposed existence of ferti valleys in the heart of Vatna Jökull, and of outlaws lurk amongst the lava crags of the Odáda-hraun. To this dis the volcanic forces of Iceland appear of late years to

retreated; and although terrible volcanic eruptions have been witnessed in the Vatna Jökull and in its immediate neighbourhood, the seat of their occurrence until this year has never been visited. The object of my late expedition was to cross the Jökull in order to determine what it really consisted of, to examine the desolate waste to the north of it, and visit the volcanoes which erupted so violently in the beginning of the present year, one of which had wrought considerable damage in the north of Iceland.

Upon my arrival in Iceland I proceeded first to examine the advancing glaciers upon the south of the Vatna Jökull, and I found that the part of the Vatna, known as Breithamerkr Jökull, had recently advanced to such an extent as to threaten to cut off all communication along that part of the southern shores of Iceland.

By June 23rd all my men had assembled.

Perhaps a brief description of the necessary equipment for an expedition of this kind may not be out of place. Everything had to be dragged upon hand-sleighs; you may, therefore, suppose that our travelling gear was reduced to the simplest necessities of existence. The most important piece of furniture was our bed, a large sleeping-bag 8 feet by 5, one side made of a layer of cork and felt covered with india-rubber, and the other side of thick blanketing covered with mackintosh: this bag was open at both ends, so that three men could lie with their heads one way, and three with their heads the other way. A hood which covered each of the openings completed our sleeping arrangements, and thus we had accommodation for six persons with a weight of only 50 lbs. The warmest method, and that which I invariably use for camping in the snow, is to dig a square hole 3 or 4 feet deep, over which I pitch a tent only 3 feet high: at the bottom of this hole the sleeping-bag is placed. Our provision consisted of pemmican in skin bags, butter, biscuit, condensed soup, chocolate, whisky, which, with a good supply of clothes and moccasins, together with the necessary implements and instruments, completed my equipment.

On June 24th, accompanied by twelve Icelanders, I set out from Nupstad, a farm upon the south base of the Vatna Jökull, and proceeded on horseback up the west side of the valley of the Diupá, which river finds its way over a lava-stream flowing from the Vatna Jökull.

Having arrived at the foot of the Jökull, I sent back my horses under the care of two men, and as it was now evening, commenced the ascent of the frozen mass before me.

The Jökull at this point last year was a crevassed glacier, the surface of which was covered with aiguilles and hummocks

of sand and ice, now all traces of the glacier were buried beneath a vast accumulation of snow. I was able, however, to use my sleighs, but the snow was very soft, so that our progress was consequently difficult and slow. After about three hours it began to snow heavily; and as we had not done a bad day's work, I decided to encamp, six of us occupying the sleeping-bag I have described, and four, who were to accompany us only a short way, made themselves as comfortable as they could with rugs and mackintosh coats in front of the tent. The morning brought only fog and snow, but as I knew the locality pretty well from my previous attempts, I decided to advance. After one hour's dragging, the fog and the storm increased, and in a short time the snow was so deep and soft that it was impossible to get through it, so I was compelled to halt till the surface of the snow was sufficiently frozen to bear us. Weather cleared in the evening, and we again advanced; but the snow by this time was up to the knees. Seeing I was tiring out my men (and as it had begun to freeze, the probability was that in about two hours the crust would be firm enough to travel on), I again halted, and casting up a bank of snow to windward, we turned in.

It was bitterly cold, but the atmosphere was very clear. My thermometer registered 20° Fahr. of frost. By 3 A.M. we were again under weigh; it was a lovely morning, the wind north-west, and as the sun illuminated the magnificent snow-slopes everything seemed to promise fine weather and success.

The sleigh travelled merrily along the frozen surface of the snow until we reached the mountain I last year named Mount Paul—after my head man who accompanied me, both at that time and upon this occasion. Mount Paul is a cluster of one large and several smaller eminences, rising to the height of 150 feet above the surrounding snow. Last year I observed that it rose directly from a larger crater, which was now filled with snow, a semicircular pit being thawed out by the radiation of the sun's rays from the south side of the mountain. Here we found an abundant supply of water. The mountain is composed of varieties of obsidian, varying from a highly vitreous obsidian to the grey stony variety, specimens of which I have before me. One portion of the mountain consisted of vitreous obsidian, cementing together multitudes of the concretionary forms, commonly known as spherulite.

At this point I sent back four of my men. The weather was execrable, and for two days it was utterly impossible to proceed. My compass had for some time been almost useless. In thick weather one has to steer principally by the wind; in fine weather a circular piece of card, marked off into four right angles, is

the best compass; so that by constantly taking the bearing of the angular position of all distinguishable points, one is able to steer a pretty straight course. In spite of the deepening snow we now plodded on, being compelled to rest about every quarter of a mile to take breath, and to clear away the snow from the front of our sleighs. We now encountered a violent storm, and we soon could see nothing but twirling clouds of snow, which wrapped themselves around us in such a manner that it was impossible to distinguish from what quarter the wind was blowing. I therefore pitched camp, but with great difficulty, for the drifting snow filled up the hole almost as soon as it was dug.

The storm continued for two days, during which time I put every one upon short rations. On the third day I was able to take an observation. I perceived two black conical mountains of no great height: one about 5 miles due north, and the other about 11 miles north-west.

From this point I obtained an excellent view of the Vatna Jökull Housie, and the snow-covered ridges leading up to its cone were perfectly discernible: they are probably lava-streams.

An extensive eruption must be appalling from these volcanoes, when any great amount of lava is ejected upon these vast accumulations of ice and snow; but minor eruptions and small streams of lava probably make but little impression. The wind unfortunately soon shifted to its old quarter, and we to ours. This was exasperating to the last degree. Towards midnight, after a brief consultation with Paul, I told my men it was of no use lying still any longer; and as the sleighs could not travel, everything must be made into packs and carried on the back; so, leaving our sleighs behind, we started, wading through the deep, loose, heavy snow. Unfortunately two of my men became ill, which compelled us again to halt. The next night we were favoured with a severe frost. I therefore sent two men back for one of the sleighs; served out some of Peek and Frean's meat-biscuits, and when we started again we made good progress northward. A fog shut down upon us, but the rim of the sun was occasionally visible through it, and bright fog-bows brought up the rear to windward.

We encamped just in time to gain shelter from a hurricane and snow-storm, such as I had never before been exposed to. We were at a height of 6150 feet. We took six hours' sleep, and, on looking out, found the storm had subsided; and for a moment the fog lifted, showing three dark mountains to the north—doubtless Skjaldbreid, Herdubreid, and Dyngjufjöll.

The storm soon returned with redoubled fury. I was again obliged to put every one upon half-rations, and at intervals it

was necessary to send a man out to clear away the snow from the top of our tent, to prevent it breaking down. It was a trying time, lying weather-bound in that bleak mountain-region, with provisions growing less and less. For three days and nights the pitiless storm beat upon our small encampment, but on the morning of the fourth day our hopes revived; the fury of the storm had beaten the snow hard, and, after serving out some warm soup, I directed everything to be packed up with the utmost expedition.

We ascended for a short distance, and then straight away commenced to descend, and presently at so rapid a rate that I was obliged to order three men to go behind to prevent the sleigh from starting on its own account for the bottom of the mountain. Suddenly the clouds cleared away before us, disclosing a deep valley at our feet, and a black mountain streaked with snow at our right. We continued our course till it became obvious that we could go no further in this direction with the sleigh; so, accompanied by Paul, I went forward to explore. The cold here was intense. I felt it severely. After having been warmed by helping to drag the sleigh, my hands, which I had been obliged to uncover to take out my field-glass, began to freeze, so I ordered two of my men to beat them with their hands, and directed the other three to put spiked iron clamps upon their feet, that they might steady the sleigh. Without this precaution we should most likely have ended our career, sleigh and all, by an abrupt descent into the valley beneath, unless we had been stopped by some of the ugly crevices that yawned halfway down the snowy steep, upon the precipitous and slippery sides of which we were descending. Upon reaching the valley, we found the wind had filled it with light pulverised snow, through which it was most difficult to force our way; as we were all thoroughly tired, I decided to halt. We rested a few hours, and again proceeded, reaching the northern base of the Vatna Jökull, leaving behind us its mysterious recesses and volcanoes, so carefully guarded from intrusion by gloom and storm. The snow here terminated in a series of ridges and cliffs of ice, in some instances so covered with débris as to be in no way distinguishable from the neighbouring hills. Before us, immediately to the north, rose a cluster of mountains, from which great quantities of steam were rising and hovering above their summits in a huge mushroom-shaped cloud; to our left and north-west lay a wide-spreading lava field, arms of which stretched among the neighbouring mountains like a troubled ocean of cindery stone; patches of black sand at intervals broke the continuity of this tract of lava, and culminated in a desert still farther to the north-east;

beyond all, the weird forms of fire-wrought mountains formed a fitting background, their rude outlines rendered still more uncouth and grim by the fierce storms of ages. A huge tongue of glacier at this point swept down to a distance of some 10 miles beyond its most northern limit, as represented upon the map published by Olsen in 1844, from a survey made by Gunnlaugsson in 1835. I here caught sight of Snœfell, and upon taking its bearings with the smoking mountains, which evidently were the Dyngjufjöll, I found that instead of being at the Kverkfjöll, which was the point I had intended to strike, I was upon the east side of Kistufell, about 9 or 10 miles further to the west. We were astonished at being unable to see anything of the Jökulsà, which, upon Gunnlaugsson's map, rises at the foot of Kistufell. Descending, we found ourselves in a large watercourse, occupied, however, by an insignificant stream, which we easily waded across. No doubt this was formerly the bed of the Jökulsà. The glacier had advanced completely over the route taken by Gunnlaugsson in 1835, thus diverting the course of the river, which now rises in several arms from the extremity of this glacial tongue. At this time we had scarcely more than two days' provisions left, so a series of forced marches were necessary in order to reach the nearest farm, viz., Grimstadir. Steering due north, we crossed a group of low volcanic hills, which were not marked upon the map; beyond these lay a desert of black sand, which the lava of the Odádahraun had entered at its south-west corner. In the middle of this small desert rose four eccentric-looking eminences, surrounded by a considerable lava field, the greater portion of which was buried in the sand; a closer approach showed them to be small volcanoes; these are situated in all probability upon a fissure in the centre of the plain. I mention them on account of their similarity to the volcanoes which have been formed this year over the fissure in the Myvatns-orœfi, of which I shall speak presently. The lava that issued from these volcanoes is basaltic, or doleritic, and bears a close resemblance to the lava from the Myvatns-orœfi. The ensuing morning we reached the main arm of the Jökulsà; here I decided on leaving my tent and the heavier part of my baggage, and strike for Grimstadir. Being thus relieved, we crossed the Svartà (or black river) to the Vathalda Hills. This river rises in the Dyngjufjöll, but is soon lost in the sand, reappearing as the Svartà, which washes the south base of the Vathalda. These hills, although of no great height, command an extensive view to the south towards the Vatna Jökull, which can be easily reached by following one of two valleys, bearing respectively west and south-west. From here I obtained the first good view of Kverkfjöll; it

appeared to be a cluster of conical mountains, and one huge crater on the north slope of the Vatna Jökull. This larger crater, although partially filled with snow, was smoking at three points, but presented no other signs of activity. Having progressed about a mile upon the Vathalda, we were soon upon the pumice which was ejected last spring from the volcano of Oskja-gjà. It has fallen in a line about 25 miles broad from the centre of the Vathalda to the south of Herdubreid; this pumice has fallen from Oskja-gjà in a band of continually-extending radii eastward to the seashore, destroying in its course six farms in the Jökull-dalr, and injuring others in the immediate vicinity. This shows that the prevalent winds during the eruption of Oskja-gjà must have been south-west. Two nights and a day, with short intervals of rest, brought us to the ferry of Grimstadir, where we obtained a boat and reached the farm of that name. The journey from Nupstad in the south to Grimstadir in the north, occupied us sixteen days; twelve of which were passed among the regions of perpetual snow. I must here remark that nothing could exceed the pluck, perseverance, and obedience of the Icelanders who accompanied me, without whom I could never have crossed the Vatna Jökull.

We rested for three days, and then started for the Odádahraun, in order to inspect the volcano whence the pumice had been this year erupted. It is situated in the southern portion of the Dyngjufjöll Mountains. I had been unable either to hire or purchase more than two horses, and as my own had not yet arrived from the south we were compelled to start on foot, using the two horses to carry our baggage and hay. I proceeded across the lava and sand desert of the Myvatns-oræfi, to the little river of Gravalandà, upon the banks of which, and those of its neighbour the Lindà, we found good feed for the horses. It was upon the banks of these rivers, beneath the shadow of the snow-capped Herdubreid, that the last of the Icelandic outlaws found a shelter. Herdubreid is one of the highest mountains in Iceland. The banks of the Gravalandà were in places thickly grown with birch and salix, but the larger wood was dead: I have noticed this in many other places. The banks of the Lindà abounded with *Angelica arctura*, the stem and roots of which are decidedly good to eat.

A weary march across the pumice brought us to the little desert where our tent had been left. During the first part of this march we had suffered greatly from want of water, but remembering that the pumice had fallen during the winter, I obtained a good supply of snow by digging through the pumice. I now sent back three of my men with the horses and all super-

fluous luggage, with instructions to procure a fresh supply of provisions, and to wait for me on the banks of the Gravalandà. I "cached" two days' provisions and proceeded to the Dyngjufjöll. I found these mountains to consist of a series of semi-detached sections, some of which had broken out in ancient times, and by their insignificant lava-streams had helped to swell the widely extending lava desert of the Odáda-hraun.

These sections of mountains described a heart-shaped form upon the south, inclosing the Askja. This is a three-cornered piece of elevated land 4000 feet high, about 6 miles long and 3 or 4 miles broad; it is easily reached by a glen upon the north-east side of the Dyngjufjöll. The principal crater which erupted this year is situated in the south corner of the Askja.

The crater is inclosed upon the eastern and western sides by mountains rising in some instances 1000 feet above the Askja plain; they appear shorn of their inner faces by the violence of the eruption, forming perpendicular cliffs of great height. These cliffs are rapidly falling in avalanches of stone occurring at frequent intervals, and had formed in two places steep slopes of pumice and débris which it is possible to descend; all access to the floor of the crater is prevented, however, by an interior rim of the precipice immediately at the base of the heights. It is well worth coming to Iceland to stand upon the summit of one of the surrounding mountains and look into the yawning crater which opens at one's feet, its grim chasms and black pits all contributing to the general aggregate of steam and loam stench, and horrid sound, while behind stretches a wild waste of glen, desert, and mountain, a country mourning in ashes and howling with desolation.

This volcano, which perhaps we may be allowed to call the Oskjagjà (the chasm of the oval casket), does not appear to have produced anything but pumice, mud, and water, copious floods of the latter having evidently flowed from its crater. It is curious to remark that although this volcano has ejected water, it is neither a glacial nor a snow-capped mountain, and it is situated more than 100 miles from the sea.

Leaving the volcano of Askja behind us and proceeding in a westerly direction we perceived that the lava from the Odáda-hraun had entered the Askja upon its most western side, having run for a considerable distance up hill. Upon descending the Dyngjufjöll to the west, a broad plain, barren and black with sand and lava, opened before us; this was the Odáda-hraun.

There was the snowy mound of Skjaldbreid, spotted with protruding lava, with its curious tuft of rock at the top, somewhat similar to that on Herdubreid; further to the east lay Kistufell, by which we first descended into Northerland, and

behind, all the white expanse of the Vatna Jökull sweeping the horizon from east to west, where it is apparently joined by Tindafell, Tungnafell, and the Hofs Jökull, for from this position we could not see Sprengi Sands. We reached Skjaldbreid: it is a mound of basaltic lava, partially covered with snow, rising to a height of about 4000 feet. Eruptions from this mountain appeared to have taken more the form of prodigious boilings-over rather than that of terrific outbursts. The summit was enveloped in clouds, so I stopped within 300 feet of the top to get a good view of the country. Before me lay the Odáda-hraun to the north-east, Oskjagjà smoking with increased vigour in the clear cool morning air; at a point farther east was the long route which lay between us and the living world, stretching away bleak and bare to where the grey pumice in the distance gave the country the appearance of lying in bright sunshine; to the south was the Vatna, its more elevated crags enveloped in gloom and mist. The pure white Jökull, the black sands and lava fields, alike cold, bare, silent, motionless, and dead.

We will now briefly retrace our steps over the wastes of the Odáda-hraun past the fire-blasted hills of Dyngjuföll to happier districts which the volcano and the glacier have still spared to Iceland. While sojourning among the sheep-pastures of the north, my attention was arrested by stupendous columns of smoke arising from the direction of the Myvatns-orœfi, and spreading out like phantoms of mammoth palm-trees amid the calm atmosphere of an autumn Sabbath morning. It was in the Myvatns-orœfi that the violent volcanic outbreaks occurred last spring; let us hasten to the scene and see what new ruin is being piled upon the old. Upon emerging from a valley which runs through the hills of Myvatn, a line of some twenty columns of smoke proclaims the seat of volcanic activity; from the north end of these a conical mound, about 150 feet in height, is erupting with considerable violence, and is rapidly forming a cone within a large crater which had evidently been formed by a previous eruption; a column of cinders is being shot to twice the height of the volcano itself, and a copious lava-stream is flowing from a breach in its most northern side and from a smaller opening at the base of the cone.

The wind is freshening from the west, from which quarter it has fortunately been blowing all day, thus enabling us to gain a neck of land now almost encircled with lava. Within a few hundred yards of the volcano itself showers of fine cinders are falling despite the adverse wind. Fountains of volcanic fire spring with loud explosions from the grim jaws of the volcano,

falling in torrents of molten sparks and fiery masses upon its glowing lips and blackened sides.

And now casting a retrospective glance at the long weary road from Nupstad to Grimstadir, which we have been the first to tread since the island of Iceland rose above the waters of the North Atlantic, what do we find? We find that the Vatna Jökull is a mass of ice and snow resting upon a nest of volcanoes; that its glaciers are rapidly increasing; that it is encroaching both upon the north and upon the south; and, granting that the Vatna is a fair specimen of the Icelandic Jökulls, that nothing can save Iceland from the advancing glaciers but a cycle of propitious seasons. We begin to recognise what an important effect this huge refrigerator has upon the climate of the north of Iceland; how it shields the northern land from the aqueous vapours which travel upward from more southern latitudes, receiving upon its broad shoulders an inordinate amount of hail and snow. We find the Odáda-hraun and the country immediately to the north of the Vatna to be a wilderness wherein the seismic forces of Iceland are still keeping up their erratic character by breaking out where least expected. First they break forth amid the snows of the Vatna, then amongst mountains which for ages had smothered their volcanic energies, then in the middle of a plain already rendered almost desolate by prehistoric outbursts. This eccentric shifting of volcanic force in Iceland may perhaps be due to the many cracks and fissures which doubtless already exist in the superficial rocks occasioned by the violent earthquakes which have from time to time convulsed the island.

II.—*On Mr. H. M. Stanley's Exploration of the Victoria Nyanza.*

By Lieut.-Colonel J. A. GRANT, C.B., C.S.I.

[*Read*, November 29th, 1875.]

THE journey recently made by Mr. H. M. Stanley, the commissioner of the 'Daily Telegraph' and 'New York Herald,' is one of the most important and brilliant that has ever been made in Central Africa, or, indeed, in any other country. For, when we consider that he accomplished it so quickly, taking only nine months from the time he left England, it seems at first as incredible as was his famous discovery of the late Dr. Livingstone. It is not alone the short time, but the great geographical question which he has finally settled—namely, he has confirmed Speke's discovery, that the Victoria Nyanza was

one vast inland fresh water—he has navigated its shores for a thousand miles, thereby proving that its waters are continuous.

Before remarking upon Mr. Stanley's two letters, dated the 1st of March and 15th of May last (a third letter has arrived through Egypt, dated 12th April, 1875), I may allude to the knowledge we had of the great Lake previous to the time when Mr. Stanley visited it.

The lakes of Central Africa were known to geographers as far back as the year 883, for in 'Tabula Alimamuniana,' of this date, also in Abul Hassan's map of 1008, we have the Nile rising from one Lake "Lacus Kura Kavar;" and in the latter map we have mention of M. Komr (Mountains of the Moon) at lat. 7° s. Several old maps, showing the lakes with their effluents, have been referred to in Lelewel's 'Géographie du Moyen Age,' and may be classed as follows:—

1154. Tabula Rotunda Rogeriana	Have 3 Lakes and 3 Rivers.
1274. Ib'n Said	
1331. Ismael Ab'ulfeda	
1274. Ib'n Said	" 1 " 3 "
1311. Bernardi Sylvani	" 2 " 1 "
1501–4. Charta Marina Portugalensis	
1507. Iohannes Ruysch	
1529. Diego Rib'ero	" 3 " 1 "
1529. Diego Rib'ero	
1540. P. Apianus. *R. Gemma.* Frisius ..	

Other more modern maps might be quoted, but during the last century map-makers seem to have left out all the lakes of Central Africa, and it is only in the last fifteen years that the centre of Africa has again been studded with its lakes.

In the year 1857, the London Geographical Society sent Captains Burton and Speke, both officers of our Indian Army, a service which I had the honour of belonging to, to explore Africa from Zanzibar *viâ* Lake Nyassa, to Egypt. Thus it was that we first heard of Lakes Tanganyika and Victoria.

Captain Speke, in 1858, went twenty marches north of Kazeh, alone, with (?) seventeen natives, to test the Arab rumour that a great ocean, which they called a bahr, or sea, existed. He found that the Arab traders had informed him correctly; a lake of almost unbounded extent stretched away from him to the north; there was, he was told, as great breadth of it on his left hand as there was on his right. He returned to England and presented his map of the discovery of the Victoria Nyanza to this Society, accompanying it with his belief that the waters he had seen were those of the Nile—but this had yet to be proved. The President for the time was the late Sir Roderick Murchison, who at once grasped the subject, and said, "Speke, we must send you back again."

Many months' preparation for his next expedition passed slowly to Speke, but at length, in 1860, he and I started from Zanzibar with 200 followers. It will give some idea of the fickle African when I tell you that we had only 40 men of the 200 when we reached Kazeh, 430 miles west of the sea-coast. Three-fourths had deserted us. We need not, therefore, be alarmed by the report of Mr. Stanley that one-half of his men were non-effective. He will enlist others, or do with fewer.

Months of weary delay again took place on the way between Kazeh and the hilly region of Karagweh, on account of the difficulties thrown in the way by the inhabitants. We wished to get on quickly, and tried to march near the Lake, but were told that the ordinary route *viâ* Usui must be kept. We accordingly went that way, and crossed the watershed at 2½° S. lat. From this position we descended the northern incline of Equatorial Africa, and never left Nile-land till we reached the Mediterranean.

After leaving Karagweh, the country, bounding the Lake on the west and north, to the capital of Uganda, may be generally described as a plain 4000 feet in altitude, but worn away at intervals of from 1 to 10 miles, with narrow excavations made by streams falling into the Lake. The route may be likened to the teeth of a saw, the points being plains and the depressions swamps. We had extensive views of the Lake from these plains; seeing its bays and islands, but no peaks nor distant ridges, nor mountain-cones to the east, nothing but a clear sea-horizon was visible, and no native could tell who lived beyond this sea.

The bays and long inlets of water or friths, seen by us on the western and northern shores, were M'werooka, Katonga, Murchison, &c. Some were completely land-locked, and 20 miles in length; I allude to the one seen near our camp at Uganda capital. It is here, probably, that Colonel Long, of the Khedive's service, found himself the other day, when he reported that Speke's Victoria Nyanza was merely a small affair of 30 miles in extent. What a prize he had at his feet!

The largest island I observed was that at Sesseh at the north-western corner of the Lake; by compass-bearing it was 40 miles long; the width could not be taken with any accuracy from the shore, but it appeared only 3 or 4 miles. It has no hills, is low in the water, and at one point I observed its shore to be within a mile of the mainland. The King of Uganda keeps his fleet of canoes here, and consults with the God of the Lake, who resides on this island.

It was mentioned last season, at one of our meetings here, by

Sir Samuel Baker, that he was given to understand the native name for the Lake was Sesseh. Petermann, in a comprehensive map published this autumn, has followed this mistake by calling the Lake Sessi See, as well as Ukerewe, and Victoria Nyanza. I explained that Sesseh was a large island, and am glad to have my statement confirmed by Mr. Stanley, who has found it to be the largest island on the Lake. Various and numerous were the other islands seen by us, but they were nearly all uninhabited, and of no importance.

The greatest river on the route between the most southern point of the Lake, round its western and northern shores, is the Kitangule Kagœra in the district of Karagweh. It rises probably from the foot of the conical mountain of M'f'oombiro, supposed by us to be 10,000 feet high; numerous lakes and valleys send their waters to it. In appearance it has a slow, majestic, winding course, which is navigable for 30 to 40 miles from its mouth; vessels drawing 25 feet of water could, I believe, float at the ferry where we crossed. Speke and I had to conjecture this depth at the ferry, because we were forcibly prevented from dropping our lead-lines into it: the King would not be pleased; it was not "canny" to take soundings.

I should not be the least surprised to hear that Mr. Stanley selects this noble river as a point for exploration. With the *Lady Alice* he can ascend this stream from the Lake up almost to King Rumanika's door; or he can cross over the mountains of Ruanda and Urundi and descend to the spot on Lake Tanganyika, where Livingstone and he had such a pleasant pic-nic; or he may select the Albert Nyanza as his field for exploration. All will be new to us; either route would interest geographers intensely, for the country, its people, and its animals are all unknown.

Leaving the River Kitangule, and proceeding north to the capital of Uganda, a distance of 125 geographical miles, we counted five-and-twenty streams, varying in depth from 3 to 10 feet, which we waded, swam, or crossed by bridge; there were numerous other smaller ones which would not give trouble even when flooded. They were mud-coloured and mud-sided—swamp-rivers, in fact.

The area of the Lake, according to Speke, who took latitudes and longitudes for its western half, and only had native information for the other half, is 645 geographical miles in circumference; and if we add to this the circumference of Lake Bahr-ingo, now said to form a portion of the Lake, we have 910 geographical miles. Speke, therefore, after his last journey in 1860–3, made the Victoria Nyanza out to be of an area not

equal to Lake Superior, which is 1500 miles in circumference, but parallel in size with Huron (600) and Erie (650).

You naturally ask how Speke came to make the Lake the size it has proved to be. There was no theory in his statement, as you will allow when I state that, at Muanza, along the west side, and on the north, he had taken its latitude, longitude, and altitude. Native travellers had gone, *by water*, from Ukereweh to Kitangule, and onwards to the capital of Uganda, also onwards to Baringo. We travelled by the western side, where the country is without mountains, low and swampy; and when Captain Speke got to the Ripon Falls, the natives told him there was as much water, from where he stood, to the East, as there was to Katonga Bay in the West, where he lately came from. Therefore it was by these measurements that he made the Lake the size it has proved to be by Mr. Stanley.

The only point where water was observed to leave the Lake was at Ripon Falls, in Uganda. Here the body of water is 150 yards wide—the depth was not calculated—but this quantity bears but a small proportion to the contents of the Lake. As to the depth of the Lake, I am inclined to the belief that Stanley's measurement will show it as a comparatively shallow body of water, resting on a vast plateau; that there is no chasm such as Tanganyika is formed of. Stanley has given us only one measurement for depth—275 feet, and had not taken the centre of the Lake. The Nile, after leaving the Lake at Ripon Falls, has a navigable course to the Karuma Falls. From here to the Albert Nyanza its course is through rock and over high falls. We have yet to learn the exact position of the river as it leaves the Albert; but it is again navigable from this to Apuddo, the village near Miani's tree; hence it again foams over rocks for some distance, and at intervals, as it runs below, and north of the Jubl Kookoo Mountain range. Colonel Gordon has, however, found it navigable farther up from Gondokoro than was suspected, namely, up to 12 miles south of Regiaf, whence all the way to Egypt—*during high Nile*—for 1620 geographical miles there is no obstruction to a boat drawing 5 or 6 feet of water.

Many will remember the enthusiastic reception given in old Burlington House where Speke and I were received after telegraphing that the "Nile was settled;" that "the Victoria Nyanza was the source of the Nile." Such a reception certainly awaits Mr. Stanley when he appears here; and if he should make more discoveries—which he undoubtedly will if God spares him—there is no honour which this Society can bestow that he will not have earned over and over again. He, as an observer, a traveller in its true sense, a provider of true and pleasant pic-

tures from unknown lands, has confirmed the discoveries made by Speke, and to him the merit is due of having sailed on the broad waters of the Lake, and sent home a map, and descriptions so vivid and truthful that the most sceptical cannot fail to be satisfied.

Here it may be as well to explain that some geographers never accepted Speke's Lake as one great ocean, although the geographical world did. The foremost of unbelievers, and the one who appeared first in the field, was Captain Burton, the companion at one time of Speke. He did not seem to have any reason for his argument. He said there must be several lakes, lagoons; anything, in fact, except *the* Lake. Even the late Dr. Livingstone and Mr. Stanley made out there must be several lakes. Livingstone wrote in a very patronising tone, "Poor Speke has turned his back upon the real sources of the Nile"—"his river at Ripon Falls was not large enough for the Nile"—and was disparaging of Speke's discoveries. The work of Dr. Schweinfurth, 'The Heart of Africa,' has fallen into the greatest blunder. Also, nearly three years ago, a map, constructed by Mr. Keith Johnston, without authority, in our map-room, was suspended from these walls, but, on my protest, the President Sir Henry Rawlinson ordered that it be altered to the delineation of the Lake by Speke. This was done.

Numbers of other writers and map-makers, Continental and English, have gone on disintegrating the Lake from book to book, map to map, and from year to year; but I think the public will now perceive how unjust the above critics have been, how firmly the fame of Speke has been established, and will not fail to accord him that place in their opinions which he may have lost for a time.

The following published maps exhibit the Victoria Nyanza divided into two or more lakes:—

'The Nile Basin,' by Richard F. Burton, 1864. Coast-line delineated only at south extremity of Lake, and the south side of the islands Kerewe and Mazita; from the Kitangule River to the Katonga: at Murchison Creek; at Napoleon Channel. Between these is placed the words "Supposed site of Victoria Nyanza." Bahari 'Ngo made a distinct lake.

'Lake Region of Eastern Africa,' by A. Keith Johnston; 2nd edition, 1872. Victoria Nyanza, a continuous coast-line from Napoleon Channel, along N. and W. sides to Urundi on E. coast; coloured only as water at the S. extremity, and round the islands Kerewe and Mazita; from a little S. of Kitangule River to a short distance E. of the Katonga; about Murchison Creek; about Napoleon Channel. The eastern side made a

distinct lake, with the name 'Bahari ya Ukara.' Lake Baringo entirely separated from the Victoria Nyanza.

'Dr. Livingstone's Routes, 1866 to 1872;' map in 'Ocean Highways,' July, 1872, by A. Keith Johnston. Victoria Nyanza, a continuous coast-line as above, with the islands Kerewe and Mazita, forming a peninsula from the E. shore; water shown only from Napoleon Channel to the Kitangule River; about the southern part of the Lake and the peninsula; along the E. coast with the name 'Sea of Ukara.' Lake Baringo quite distinct.

'How I found Livingstone,' by H. M. Stanley; map by E. Stanford, 1873; S. of equator only. Coast-line of Victoria Nyanza only delineated, and water coloured at Jordan's Nullah, a little past Muanza, the Bengal Archipelago, and S. side of Kerewe and Mazita Islands; from opposite Mashonde to the equator; on the E. side about Kavirond of Wakefield's map, with name 'Sea of Ukara.'

'Livingstone's last Journals,' 1874; Map of the Forest Plateau of Africa, by E. Stanford. From E. of Muanza to Ripon Falls the W. and N. coast of the Victoria Nyanza is shown as delineated by Speke, but with the opposite coast generally parallel to it, at a distance of 30 to 50 miles, with the name Lake Okara; E. of the extremity of this Lake is placed another, 60 miles long by 50 broad, named Kavirondo, and connected with Lake Okara by the Kidette River. Lake Baringo is also detached, and communicates with the Asua by the River Ngardabash.

In Sketch-map of Dr. Schweinfurth's routes, 1868–71, by E. Weller, in 'The Heart of Africa,' by Dr. Schweinfurth, a series of five distinct lakes of small extent, connected by rivers, takes the place of the Victoria Nyanza. Of these, Lakes Ukara and Ukerewe, respectively the E. and S. extremes of the Victoria, are named. Lake Bhari Ngo is quite separate (drained by the Asua), receiving at the N. the waters of Lake Zamburu, by a river from its S. extremity, which last receives the waters of another lake, not named.

Besides these I might also mention:—

'Sud Afrika und Madagaskar,' by Dr. Petermann; No. 45 of Stieler's Hand-Atlas, 1872. In this 'Ukerewe' (Victoria Nyanza), 4308 feet (?), is shown according to Speke, except that there is no E. coast marked; Lake Baringo is also omitted.

In Colonel Long's map of his visit to M'tesa and the Victoria Nyanza, published by the Chief of the Staff, Egyptian Army, the Lake is shown to have a width of only 20 miles from the N. coast.

It is now my place to make some comments on Mr. Stanley's journey.

Starting from Zanzibar, in the month of October, 1874, with 300 followers, he made a rapid journey of 720 miles to the south-east corner of Victoria Nyanza, performing this distance in 103 days, inclusive of halts. Through forests, across deserts and rivers, he conveyed the boat, *Lady Alice*, in sections, and launched her on the Lake. The forethought and energy required to convey this boat must command the fullest admiration, for in doing so, he has navigated the Inland Ocean, and given us a thrilling account of its extent, its rivers and shores, and its beautiful islands.

He experienced almost stunning losses and privations in his land journey. Having to travel through sterile, unhealthy regions, the want of food and water was felt severely; his men suffered from sickness—death was rife amongst them—and he had to contend against the Waturu race, who sounded their war-drums, and killed twenty-one of his men. After contesting with them for three days, and clearing a way for his advance, he continued his march towards the Lake. In his letter of the 15th of May, allusion is made to a fight from his boat with the Wavuma race; but as no particulars are furnished, the account may be in the correspondence sent *viâ* Uganda to Egypt.* The Island of Uvuma, at the north-end of the Lake, is the position mentioned.

On the 27th of February last he obtained his first view of the great sea, and it can be imagined how impatient he must have been, and how hard his men must have worked to put the *Lady Alice* together, to have a short trial on the Lake before taking to sea in her. There are many questions which we should like to ask Mr. Stanley here; but we must be content with his map now before us, with its rivers, islands, and broad expanse of water.

Of the rivers which he observed during his voyage round the south, east, north, and west coasts, he gives, commencing with the most southern and proceeding northwards, the Monunguh, Luwamberri, and Duma; these three join and form the Shimeeyu. The Ruana falls into Speke Gulf, and is made 90 miles in length. Fifty miles farther north comes the Mara, 70 to 80 miles. Twelve miles north there is the Mori; then in succession, the Shirati, Gori, Ugoweh, and Yagama. In all, ten rivers are in the map: The only one described—the Leewumbu, or Shimeeyu—seems to be the only important river.

* This correspondence has reached England since the above was written. The people use slings, a fact which corroborates what we learnt in Uganda.—J. A. G.

It rises in 5° S. lat., and 35° E. long., runs a course of 170 miles, where it and two others join to form the Shimeeyu, which extends for 100 miles farther. The width of the Leewumbu in the dry season is 20 feet, and depth 2 feet. Mr. Stanley gives great importance to the Shimeeyu, saying its course is roughly 350 miles, that it is one mile wide at its mouth, and 400 yards across above the mouth. This river may prove to be the most southern waters of the Nile. But the River Ugoweh, at the north-east corner of the Lake, must be a considerable stream also, for hippopotami were seen in it. No remarks are made on the other streams.

We therefore have but one great stream on the whole length of the eastern shore of this great Lake; and we know that on the western shore there is the same coincidence, namely, the Kitangule-Kagera, the only river which obliged us to cross by canoe. The River Katonga we heard much spoken of as a troublesome stream, but I do not think it can be navigable from the bay.

It seems as if the great brown plains, which Mr. Stanley speaks of as bounding the Lake to the east, drank up all the rain that falls upon them. Everywhere he heard of plains to the east; even the "Towering Table" mountain of Majita or Mazita, east of Ukerewe Island, was seen to be surrounded by plains; also the island-like mountains of Ururi, Uramba, and Shashi, they, too, had their plains; but all these being within the radius of 40 miles (*vide* map), I take it they are remains of an old plateau, being 3000 feet above the level of the Lake. There is a similar table-mountain at Cheysimbee (mentioned in Stanley's map) on the opposite coast, but it is only 400 feet above the plain.

The mountains of Ugeyeya are called gigantic, for Mr. Stanley says, "We pass between the Island of Ugingo and the gigantic mountains of Ugeyeya, at whose base the *Lady Alice* seemed to crawl like a tiny insect, while we on board admire the stupendous summits." There is nothing as to size or summit on the other side of the Lake to compare with this description of the equatorial mountains of Ugeyeya. This seems to be rather a mountain region, for, to the east of the "Bridge" or Basalt Isles, a "flat and slightly woody district, varied at intervals by *isolated cones*," was visible from the summit of the Isle. Manyara at the north-east angle of the Lake, on the eastern side of the bay, is "a land of bold hills and ridges, while the very north-eastern end, through which issues the Yagama River into the Nyanza, is flat."

Having examined all the notes on the mountains of the east coast, we can say that there are no mountains, no volcanic

cones, to be compared with them as to their height and *proximity to the Lake* on the west coast, where the whole country is flat from Kitangule, north, and the streams run to the Lake like hare-soup down a tilted plate, leaving deep furrows in the plain. We saw several long valleys which, no doubt, once were "friths" in the Victoria Nyanza, they are silted up; thousands of acres of land on the west coast are in this state. I therefore cannot but conclude that the fairway of the Lake will be found on the east coast, and that the miles of swamps and shallow water in the west do not exist to the same extent on the other shore. But this interesting question will, I trust, soon be settled when we receive Mr. Stanley's observations on depths.

No fewer than sixty to eighty islands may be counted upon Mr. Stanley's map, dotted generally in clusters all round the shores, at distances of 2 and 3 miles from the mainland. The largest in the whole Lake is Sesseh, which we made 40 miles in length. Mr. Stanley makes it 35 × 25. Passing to the south of the Kitangule, we have Bumbireh, 25 × 8; and following the curves of the Lake, Ukerewe, 32 × 7; Ugingo, 20 × 5; Usuguru, 22 × 5; and Uvuma, 15 × 10. The remaining islands are small in comparison to those mentioned here, and the majority of the islands are near the northern shore, at the end where the waters leave for Egypt, and the others are chiefly by the shores of the southern third of the Lake.

If we examine the areas of the islands mentioned above, for instance, Sesseh—or, as Mr. Stanley calls it, Sasse—it has an area of about 700 English square miles; the dimension of this one island will give some idea of the importance of this inland sea, which is probably the largest body of fresh water—*at this altitude*—in the known world.

Captain Speke attached the Lake Bahr-ingo to his lake at its north-east corner. Rev. T. Wakefield places it 50 miles detached from the Lake; but Mr. Stanley inquired of the natives regarding it, and was told there was no Lake in that direction. However, considering that the native information obtained by the two former gentlemen has proved to be correct in most cases, and that it was obtained independently, on this account I do not give in to the non-existence of the Bahr-ingo Lake. He mentions that the River Ugoweh joins the Lake here, and is of considerable size. Hippopotami were seen there by him, and it may be the water communication which Speke heard of as connecting the Bahr-ingo with the Nyanza. There is also the Yagamo here.*

* Since the above was written, another letter from Mr. Stanley states that Baringo begins north of Ugeyeya, is a country 15 miles of latitude, with deep

Regarding the altitudes taken by Mr. Stanley, we find that in leaving the desert plain of Ugogo, he ascended to another plateau, 3800 feet; and again as he proceeded north-west, he came on a still higher one of 4500 feet, and his greatest altitude was 5100 feet, which is the watershed between the Lake and the sea-coast. This last height corresponds with the highest *inhabited* country Speke and I traversed in our journey, namely, the capital of Karagweh, which approaches to within 50 miles of the W.S.W. end of the Lake.

The height of the Nyanza above the sea was 3550 to 3650 feet by one aneroid, and 3575 to 3675 by another. A further observation by Mr. Stanley, with two boiling thermometers, made the altitude, subject to correction, similar to Speke's, namely, 3808, or 68 feet in excess of Speke's observations. The difference is insignificant, and we may accept them as the established altitude of Victoria Nyanza.

Mr. Stanley found that his latitudes along the Uganda shores differed from Speke's by an average of 14 miles. This difference of 14 miles may be accounted for, as suggested to me, by his having forgotten to apply the semi-diameter of the sun to his observations. It should also be taken into consideration that the sun was close to the Equator when he observed for latitude at noon, and that, under such circumstances, the observation would be a very doubtful one. His longitudes varied little. In one instance, that of the Katonga, Stanley made it 16 miles north latitude on his map 22, while Speke's observation was a few miles south of the Equator. The two observers observed differently; but this is no reason for discrepancy. Mr. Stanley took the sun at noon with a sea-horizon, and made an observation for longitude in the afternoon. He cannot understand how Speke—who was on shore—observed, unless it was by double altitude of the sun; but I can give the explanation. Speke took his latitudes by observing the meridian altitude of suitable stars with an artificial horizon, and generally found a star of the first magnitude for his purpose. At Katonga he had Capella and Canopus (both first magnitude). Indeed, while in Uganda, it will be seen from the following, that he used no others. The observations were checked by the fact that he was travelling north at every stage; his dead reckoning would correct him. I cannot see how to account for such a blunder, for I have the fullest confidence in his observations:—

land-locked bays. "Thus hereabouts almost a lake is formed separate from the Victoria Nyanza." This is very important, as it confirms Speke's statement that Baringo was connected by water with the Victoria Lake.—J. A. G.

31st January, 1862,	at Meruka, by star (1st Mag)	Capella	..	Lat.	36' 2"	S.
1st February, 1862,	at Sangwa ,,	Capella	..	Lat.	30 47	
2nd ,,	at Masaka ,,	Capella	..	Lat.	20 2	
6th ,,	at Kituntu ,,	Canopus	..	Lat.	7 40	S.
9th ,,	at Nakusi ,,	Capella	..	Lat.	7 15	N.
10th ,,	at Kibibi ,,	Capella	..	Lat.	15 0	
12th ,,	at Nakatema ,,	Capella	..	Lat.	17 55	
13th ,,	at Niamagoma ,,	Capella	..	Lat.	17 15	
25th ,,	at Bandowaroga ,,	Canopus	..	Lat.	21 19	

Speke never rested satisfied with an indifferent observation; he repeated it by another star on the same night or following opportunity, so that he took many more observations than are recorded, and only registered those which gave him confidence.

At the station immediately south and north of the Equator he observed as follows for longitude and variation:—

3rd February, 1862,	at Masaka	5 altitudes and 3 compass bearings.
4th ,,	at Masaka	3 distances.
10th ,,	at Kibibi	10 altitudes and 7 distances.
11th ,,	at Kibibi	12 altitudes, 5 distances, and 1 compass bearing

The area of Victoria Nyanza, as made known to us by Mr. Stanley, proves that Speke far underrated its extent. I have carefully measured the maps of both travellers with compass to ascertain their existing difference, measuring every 10 miles, and the result; by this rather rough means, obtained is as follows. The map in Speke's book was the one measured from:—

Circumference of Speke's Lake .. .. 615 geographical miles.
,, Stanley's Lake .. ... 890 ,,

If we add 265 geographical miles, the circumference of the Bahr-ingo Lake in Speke's map, we get 910 miles as one body of water—a curious similarity, in circumference, to Stanley's single Lake—only 20 miles of difference.

Mr. Stanley thinks the mode of spelling Nyanza is objectionable, because he says the natives do not pronounce it in this way. Let me first explain that in using the expression Lake Victoria Nyanza, we actually say Lake Victoria Lake—Nyanza signifying Lake. All that is necessary, when using the word is to call it the Victoria Nyanza, or Victoria Lake. As to the spelling and the pronunciation of the word, we find that it is sounded differently in different localities, and different people spell it differently:—

In old maps	Niauja, of 3 syllables.
In Livingstone	N'yassa, of 2 ,,
1863 Speke and Grant	N'yanza, of 2 ,,
1870 Rev. T. Wakefield's Sadi ..	N'yanja, of 2 ,,
1875 Mr. H. M. Stanley	Niyanza, or Nee-yanza, of 3 syllables.

Nyassa, Nyanz-a (nasal *n*), and N'yanja, have a more liquid sound than the three-syllable word of Nee-yanza; and we found

the Waganda and Wanyoro pronounced it by the method adopted by us.

Some allusion may be made to the names of the countries which were observed by Mr. Stanley on the east and north-east shores of the Lake, trying, by comparing them with the routes given by the Rev. T. Wakefield, to find similarity or identification; but, after a close examination, I have failed to dovetail the routes of the latter with Mr. Stanley's names. Sadi, Mr. Wakefield's informant, was correct in describing the extent of the Lake, and conjectured that the northern stream from Lake Bahr-ingo "enters the Nyanza to the northwards;" but, as already stated, Mr. Stanley found the country of Baringo almost land-locking an arm of the Victoria Nyanza at the place where Speke had his Baringo Lake.

The only names which tally are given below, and I leave it to others to make farther inquiry:—

Wakefield's Map.	*Stanley's.*	*Speke.*
	Shashi	.. Ushaki.
	Ururi	.. Urudi.
Kavirond	.. Kavirondo.	
Ukara (Mainland)	Ukara (Island).	
Ligeyo	.. Ugeyeya.	
	Uvuma (Island) ..	.. Uvuma.
	Usoga	.. Usoga.
	Manyara	.. Amara.
	Bumbireh (Island) ..	.. Umbiré (Mainland).

Few, indeed only one in Speke's case, of the above places were visited either by Sadi or Speke; they were obtained by inquiry from natives, and their positions are tolerably accurate when compared with the same places fixed, I presume, astronomically by Mr. Stanley.

Two skilfully executed maps were drawn to show the relation of Stanley's work to that of Speke: one representing the map of Stanley upon that of Speke, the other reducing Stanley's map to Speke's latitudes and longitudes.* They were the work of Mr. Turner, the Assistant Curator in the Map-Room of our Society. He pointed out to me that if we compare the latitude and longitude given in Stanley's letters with those in his map, they differ in 11 instances, and from 5 to 18 miles.

Allusion may be made to two statements in Mr. Stanley's letter of the 12th April, that M'tesa was King of Karagweh, Uganda, Unyoro, Usoga, and Usui; and that he observed a positive tide in the Luaserri during the morning, for two hours it flowed north, and two hours south; he was told that this is peculiar to all the inlets on the Uganda coast.

* Two maps were published in the 'Proceedings,' vol. xx. p. 135.

As regards the former, we found that although M'tesa had great influence over the rulers of these places, sending his men as far even as Zanzibar, he was king only in his own country, which extends properly from the Katonga to Unyoro and Ripon Falls, where alone the true Waganda live. Regarding the tides, we remarked none in the Lake or any portion of it, and I attribute the motion he observed to the wind blowing down the Lake.

In concluding these few remarks on Mr. Stanley's journey, I may state that they are made on my own authority by request of the President of the Geographical Society, for I felt that it was not for me to come forward as the champion of Speke, he required no such bolstering; in fact, I should have preferred that some other and more competent hand wrote a comment on Mr. Stanley's journey. However, I have great pleasure in complying, for it has opened up to me an old love, and given me an opportunity of congratulating the Society on the great achievement before them. Who amongst us would have had his energy? Who would undertake a cruise in an open boat and absent himself from his camp for fifty-eight days? Who would risk such danger to life and exposure to an African sun in the month of April? Who of us are able to guide, provide for, lead and attend to a little army successfully, and, in the midst of all this, take their observations for latitude and longitude? I think him a worthy representative of the energy which sent out such an expedition.

Postscript.—Since hearing that Mr. H. M. Stanley had circumnavigated all but the south-western corner of the Victoria Nyanza, we learn from the 'Daily Telegraph' that he has completed the circuit of this Lake, and visited the Albert and Windermere Lakes. This information is given in five despatches, which are full of adventure and geographical interest.

1st. Letter dated Mahiya Island, 3 miles from Bambireh Island, Victoria Nyanza, July 19, 1875.

2nd. Port of Dumo, South-Western Uganda, August 15, 1875.

3rd. Kawanga, frontier village between Unyoro and Uganda, January 18, 1876.

4th. Kafurro, Arab depôt near Rumanika's capital of Karagweh, March 26, 1876.

5th. Ubagwe, Western Unyamwezi, 14th April, 1876.

There are three letters from Francis John Pocock, dated the 15th May, 1875, Secomia; 14th August, 1875, Uganda, Victoria Nyanza; 18th April, 1876, Central Africa.

Mr. Stanley had gone by water from the western shore to his camp on the south-eastern side, having first had some

adventures with the Wasongora and Wa-Bambireh; he then wished to make a land journey from his camp round the south end of the Lake, but a powerful chief sent a polite-enough letter intimating that there was no road for travellers through his country. Never without resources, Stanley arranged with the Chief of Ukerewe Island to make the journey by water with a fleet of thirty-two canoes, and reached Refuge Island by making two trips; from here he proceeded in force towards Bambireh Island to demand satisfaction of its chief for the murder of some of his Waganda allies, and for having stolen the oars of the *Lady Alice*. He met with a hostile reception as a matter of course, and after killing forty-two men and wounding one hundred others, he proceeded to Dumo, a port on the western mainland, midway between the rivers Katonga and Kagera.

I think that Mr. Stanley committed a serious mistake in making this attack and in meddling with the old quarrels of his allies—the Waganda—for such demonstrations leave their mark, and check the prospect of friendly intercourse for years.

From the port of Dumo he proceeded west and north-west, escorted by 2000 spearsmen, "handsomely provided by King M'tessa, of Uganda," and arrived on the shores of the Albert Lake. Here his powerful guard were so frightened of the Wanyoro inhabitants that they refused to allow Mr. Stanley sufficient time to make the exploration of the Lake—he merely had a day to look at it and drink its waters. This must have been a grievous disappointment; but, though unable to launch the *Lady Alice*, he has ably described the new region between the lakes Victoria and Albert; and though foiled by the Waganda, he will get from the south-west and make an examination of the Albert Lake. From what we know of Mr. Stanley's resolution, this will be done if health and life are spared to him.

Again from the Port of Dumo his explorations led him to the River Kagera, which he ascended for three days and went by land to the Arab depôt of Kafurro—a place which Speke and I visited, near the capital of King Rumanika, of Karagweh. He writes in high terms of our old friend the king, calling him "the generous, gentle, sweet-tempered Rumanika;" and adds, in allusion to having received aid in food, canoes, and escorts from him, "thus another African monarch assisted geography." It may be mentioned here that Stanley was so struck with the dimensions of the River Kagera, which was 84 feet deep where he measured it, that the thought "flashed upon him that he had found the true parent of the Nile." As far as we now know, there is no river flowing into the Victoria Lake which can compare with it in volume of water, and whether it is called

the Kagera or the Kitangule by the natives—both names appertain to it—Stanley is of opinion that, although Speke showed extraordinary judgment and acuteness in his geography, he was in serious error when he called this river the Kitangule. By Stanley's account, it ought to be named the Kagera. I see by Speke's map that one of its tributaries is called the Kageri, or Ingezi, but from below the ferry of Kitangule to the Lake he had applied the latter name to it.

Mr. Stanley was enabled, through the friendship of Rumanika, to proceed in the *Lady Alice*, escorted by canoes manned by Wanyambo, the peasantry of Karagweh, to the great system of lakes which were seen by Speke and me to radiate their waters to the Kitangule River. He found one lake to be 80 miles in length, and most of them enclosed by the gigantic papyrus. Having seen the two lofty sugar-loaf cones of Mount M'foombiro, calculated by him at 12,000 feet in height, and having visited the hot springs, he anxiously inquired of the king whether the Albert Lake might be visited from the Karagweh side. The king replied decidedly in the negative. The people of M'pororo and Ruanda were hostile to foreigners, and the Warundi were, if possible, more destructive than any race he knew. Stanley had no alternative but to proceed to Ujiji, from whence he intended examining the portion of Tanganyika which he had not explored; he would also make another attempt to reach the Albert, but from the Tanganyika end of it. His last camp was at Ubagwe, in Western Umyamwezi; from here to Ujiji he would find a difficult and entirely unknown country to pass through. We therefore look forward with much interest for his next communications.

The actual work done by Mr. Stanley in his late journeys consists in his traversing 600 geographical miles by land and water; all of which is newly discovered, except the portion of Karagweh and Uganda which Speke and I visited. He has filled in the south-west corner of the Lake, jotted down about twenty islands, mapped the region dividing lakes Victoria and Albert, named the Beatrice Gulf, and extended our knowledge of the Lake district to the north-west of Karagweh. This is enough for one man to do in a lifetime, but he still seeks to do more.

The geographical details are far better in his own words, and are given here along with one of Pocock's letters, dated the 18th day of April, 1876. I will, however, endeavour to make a few remarks upon his present correspondence, as he has been censured for killing the natives.

Mr. Stanley had an escort of Waganda ever since his visit to the king. This connection was the cause of bringing him into trouble, for the Waganda are such noted plunderers that

their appearance acts as a warning of danger to the races in their vicinity. The Bambireh people were evidently exasperated by the Waganda, and retaliated by seizing Mr. Stanley's oars. However, fortunately for him, he was able to out-manœuvre them by his determined pluck and inventive mind, for he paddled his drifting canoe with its seats and crossed the great lake through "sounding surf" to the opposite shore.

After such excitement, exposure to storms, and long fastings, it was not strange that he should become ill; for nine days he remained prostrated at his headquarter camp, meditating on the past and planning for the future. In reflecting on Uganda and its people, he writes of it with much truth, "But most of all the memory clung to Uganda, that beautiful land, with its intelligent king, and no less remarkable people." Here "our minds received the deepest impressions, and therefore retained the fondest recollections," &c., &c. This is but a fifth of what he writes about this bright spot on the Equator, and I can echo his sentiments by adding that it deserves a kind protection and happy future.

Several new tribes have been made known to us by Mr. Stanley—the Wa-Bambireh, Wuvoma, Wankori, and Wanyampaka, who seem each to be powerful, numerous, and independent—much more so than the tribes by the shores of Tanganyika, who have been destroyed by the incursions of slave hunters. These people, as also those of Ruanda, Urundi, and the southern end of the Lake, forbid the foreigner from entering their country, because they think no good would follow; but when they are civilised by kindness and consideration, and see that their rights are respected, they will readily open their countries to commerce. The white people with woolly hair, whom he describes as similar to Prince Nyamionju of Uganda, are difficult to make out without some further information; but, from Mr. Stanley's account and my own opinion, they seem to be a type of fair-skinned Wahuma—an Abyssinian-like race of tall people, who hold large tracts of grazing country and own hundreds of cattle.

It is scarcely possible to say where Mr. Stanley is exploring since he left Karagweh, but he may probably have examined the outlets and inlets to the Tanganyika, and then reached the Albert Lake. If he does so, he will return *viâ* Egypt to England, having navigated the *Lady Alice* through lakes Victoria, Albert, Windermere, and Tanganyika.

Kawanga, frontier village between Unyoro and Uganda,
Central Africa, Jan. 18, 1876.

Our march across Uganda west and north-west was uninterrupted by any event to mar the secret joy I felt in being once more on the move to new fields of exploration. We made a brave show of spears and guns while

moving across the easy swells of pastoral Western Uganda. Game was also abundant, and twenty-seven harte-beests fell victims to my love of hunting and our necessities.

Having arrived at the frontier of Unyoro, we made all warlike preparations, and on January 5th entered Kabba Rega's territory. The people fled before us, leaving their provisions in their haste behind them, of which we made use. On the 9th we encamped at the base of the tremendous mountain called Kabuga, at an altitude of 5500 feet above the sea. East of the low river ridge on which we pitched our tents the Katonga River was rounding from the north to the east, on its course towards Lake Victoria; and west of the camp the Rusango River boomed hoarse thunder from its many cataracts and rapids as it rushed westward to Lake Albert. From one of the many spurs of Kabuga we obtained a passing glimpse of the king of mountains, Gambaragara, which attains an altitude of between 13,000 and 15,000 feet above the ocean. Snow is frequently seen on it, though not perpetual. Upon its summit dwell the chief medicine-men of Kabba Rega, a people of European complexion. Some half-dozen of them I have seen, and was reminded of what Mukamba, King of Uzige, told Livingstone and myself respecting white people who lived far north of his country. They are a handsome race, and some of the women are singularly beautiful. Their hair is kinky, and inclined to brown in colour. Their features are regular, lips thin, but their noses, though well-shaped, are somewhat thick at the point. Several of their descendants are scattered throughout Unyoro, Ankori, and Ruanda, and the royal family of the latter powerful country are distinguished, I am told, by their pale complexions. The Queen of the Sosua Islands, in the Victoria Niyanza, is a descendant of this tribe. Whence came this singular people I have had no means of ascertaining except from the Waganda, who say that the first King of Unyoro gave them the land around the base of Gambaragara Mountain, wherein through many vicissitudes they have continued to reside for centuries. On the approach of an invading host they retreat to the summit of the mountain, the intense cold of which defies the most determined of their enemies. Two years ago the Emperor M'tesa despatched his Prime Minister with about 100,000 men to Gambaragara and Usongoro; but though the great General of Uganda occupied the slopes and ascended a long way in pursuit, he was compelled by the inclement climate to descend without having captured more than a few black slaves, the pale-faced tribe having retreated to their impregnable fortress at the summit.

The mountain, it appears, is an extinct volcano, for on the top of it is a crystal-clear lake, about 500 yards in length, from the centre of which rises a column-like rock to a great height. A rim of stone, like a wall, surrounds the summit, within which are several villages, where the principal medicine-man and his people reside. Two men of this tribe, who might be taken at first glance for Greeks in white shirts, accompanied Sekajugu, a sub-chief under Samboozi, and our expedition to Lake Albert and back to Uganda; but they were extremely uncommunicative, and nothing of the history of their nation could I obtain from them. Their diet consists of milk and bananas, and they were the only men of rank in the entire force under Samboozi who possessed more than two milch-cows to supply them with milk while on the march. Sekajugu, to whom they were friendly, and under whom they had enrolled themselves, states that they rebelled against Kabba Rega, and, to avoid his vengeance, sought refuge with himself. Another specimen of these white-complexioned people I saw at the Court of M'tesa in the person of Prince Namionju, the brother of the reigning King Nyika of Gambaragara. When I first met this man I took him for a young Arab of Cairo who had chosen to reside in Uganda for some unknown reason, and it was not until I had seen several specimens of the same pale colour that I could believe that

there existed a large and numerous tribe of such a singular hue in the heart of Africa, remote from the track of all travellers and trading caravans. Africa is certainly the "haunt of light-headed fable," romance, and superstition, but I shall believe ever hence that there exists some slight modicum of truth in all the statements and revelations of these simple folk. On the shores of the Victoria, in Usukuma, I heard of a people far north possessing very large dogs of such fierce nature that they were often taken to war against the enemies of their masters. These people I subsequently ascertained to be the Wakedi, a tribe living north of Usoga. The same tribe also, in their various wars with Uganda, have frequently been found wearing iron-armour! Again, about four years ago, when exploring the Tanganyika with Livingstone, I heard there existed a white race North of Uzige. At that time Livingstone and myself smiled at the absurdity of a white people living in the heart of Africa, and ascribed the report to the light-brown colour of the Warundi. Now, I have not only seen the country of these white people, but several specimens of themselves at various periods and in different places. Were it not for the negroid hair, I should say they were Europeans or some light-coloured Asiatics, such as Syrians or Armenians. *Apropos* of these singular creatures, I have heard that the first King of Kisbakka, a country south-west of Karagwe, was an Arab, whose scimitar is still preserved with great reverence by the present reigning family.

Our further passage to Lake Albert was along the southern bank of the Rusango River, which winds in and out among deep mountain folds, and rushes headlong on its course in roaring cataracts and brawling rapids. Ten hours' swift marching enabled us to cross an uninhabited tract of Ankori and emerge again in Unyoro, in the district of Kitagwenda, which is well populated and cultivated. Our sudden appearance on the scene, with drums beating, colours flying, and bugles blowing, drove the natives in a panic from their fields and their houses, in such hot haste, that many of our people found the family porridge still cooking, and great pots full of milk standing ready for the evening meal. It had been previously agreed upon between "General" Samboozi and myself that if the inhabitants chose to permit our peaceful passage through Unyoro, no violence was to be done to any person. But at Kitagwenda we found ourselves in possession of a populous and thriving district, with not a single soul near us to give any information. Lake Albert, on the evening of January 9, was about three miles due west, and it behoved us that we might not be surprised to obtain information as to the feelings of the country towards us. Samboozi was clever enough to perceive the position, and he consented to send out 200 men next morning as scouts, to capture a few men, through whom we could communicate with the Chief of Kitagwenda, and satisfy him that if unmolested we had no hostile intention, but that if permitted to reside two months, we would pay him in cloth, beads, or wire for whatever we consumed.

The next day was a halt, and the scouts brought in five natives, who were sent with a peaceful message to the chief. This individual did not deign to answer us, though we knew he resided on the summit of the mountain close by. On the 11th we moved our army to within one mile of the edge of the plateau, 1000 feet below which was the Albert Niyanza. Here we constructed our camp on the morning of the 11th, and, receiving no word from the chief of the Kitagwenda or of Unyampaka,* sent 500 Waganda and 50 of the Anglo-American Expedition to seek out a locality for a fenced post, and to borrow the use of all canoes along the coast at the base of the plateau on which we were camped. In about three hours the reconnoitring party returned, bringing information that they had only succeeded in securing five small canoes, too small to be of

* "The country of cats," literally.—J. A. G.

any service to us, and that the alarm had already spread far along the shores that a large force of strangers had arrived at the lake for war purposes.

The 12th was spent by me in endeavouring to induce Samboozi to move to the lake, that we might build a fortified place and put the boat *Lady Alice* together, but it was in vain. The natives had by this recovered their wits, and, strongly reinforced from the neighbouring districts, they were preparing themselves for an effort to punish us for our temerity. Once we sallied out of our camp for a battle; but they, while withdrawing, told us mockingly to keep our strength for the next day. Unable to persuade Samboozi to move his camp or stay longer than the next day, there remained for us only to return to Uganda, and accordingly on the night of the 12th it was resolved to return and try to discover some other country where the expedition could camp in safety, while I explored the lake in the *Lady Alice*. On the morning of the 13th we set out on our return from the Albert in order of battle; 500 spearmen in front, 500 for the rear guard, and 1000 spearmen and the expedition in the centre. Whether it was our compact column that prevented an attack or not I cannot say, we were, however, permitted to leave the country of Kitagwenda unmolested, the natives merely closing in on our rear to snatch stragglers. On the 14th, as we entered Benga in Unyoro, they rushed out from some woods to attack us, but a few rounds of ball-cartridge dispersed them. On the 18th we re-entered Uganda.

However slightingly your readers may think of our trip to the Albert, honestly I do not suppose I have ever been guilty of such a harebrained attempt as this before. I sometimes think, though it would have been entirely contrary to orders, that it would have been better to have launched the boat and to have explored the lake, leaving the expedition to take care of itself, to perish or survive my absence. But I felt it would be too great a pity, and that if one road was closed there might probably be others open; so that after much deliberation with myself, I resolved to return and endeavour to discover a part of the shore more amenable to reason and open to friendly gifts than hostile Unyoro or Ankori.

Though we made strict inquiries, we could glean no news of Gordon or his steamers; the natives of Unyampaka had never heard of a ship or any vessel larger than a canoe; and it is impossible that a vessel so singular as a steamer could approach near Usongora without the news of such an apparition becoming notorious.

The geographical knowledge we have been able to acquire by our forcible push to the Albert Niyanza is considerable. The contour of the plateau separating the great reservoirs of the Nile, the Victoria and Albert Niyanzas, the structure of the mountains and ridges, the course of the watersheds, and that of the rivers Katonga and Rusango, have been revealed. The great mountain Gambaragara, and its singular people have been discovered, besides a portion of a deep gulf of the Albert, which I have taken the liberty to call, in honour of her Royal Highness the Princess, Beatrice Gulf. This, almost a lake of itself, is formed by the promontory of Usongora, which runs south-west some 30 miles from a point 10 geographical miles north of Unyampaka. The eastern shore of the gulf is formed by the countries of Irangara, Unyampaka, Buhuju, and Mpororo, which coast-line runs a nearly S.S.W. course. Between Mpororo and Usongora extend the islands of the maritime state of Utumbi. West of Usongora is Ukonju, on the western coast of Lake Albert, reputed to be peopled by cannibals. North of Ukonju is the great country of Ulegga. Coming to the eastern shore of Lake Albert, we have Ruanda running from Mpororo on the east to Ukonju on the west, occupying the whole of the south and south-east coast of Lake Albert. North of Unyampaka, on the east side, is Irangara, and north of Irangara the district of Toro. Unyoro occupies the whole of the east side from the Murchison Falls of the Victoria Nile to

Mpororo, for Unyampaka, Toro, Bubuju, and Irangara are merely districts of Unyoro. The great promontory of Usongora, which half shuts in Beatrice Gulf, is tributary to Kabba Rega, though governed by Nyika, King of Gambaragara. Usongora is the great salt-field whence all the surrounding countries obtain their salt. It is, from all accounts, a very land of wonders, but the traveller desirous of exploring it should have a thousand Sniders to protect him, for the natives, like those of Ankori, care for nothing but milk and goat-skins. Among the wonders credited to it are a mountain emitting "fire and stones," a salt-lake of considerable extent,* several hills of rock-salt, a large plain encrusted thickly with salt and alkali, a breed of very large dogs of extraordinary ferocity, and a race of such long-legged natives that ordinary mortals regard them with surprise and awe. The Waganda, who have invaded their country for the sake of booty, ascribe a cool courage to these people against which all their numbers and well-known expertness with shield and spear were of little avail. They are, besides, extremely clannish, and allow none of their tribe to intermarry with strangers. Their diet consists solely of milk. Their sole occupation consists in watching their cows, of which they have an immense number; and it was to capture some of their herds that the Emperor of Uganda sent 100,000 men, under his Prime Minister, to Usongora. The expedition was successful, for by all accounts the Waganda returned to their country with about 20,000 head; but so dearly were they purchased by the loss of human life, that it is doubtful whether such a raid will again be attempted to Usongora.

I propose to rest here a couple of days, and then to proceed to Karagwe to discover another road to Lake Albert.

P.S.—Our camp on Lake Albert in Unyampaka was situated in E. long. 31° 24′ 30″ by observation, and N. lat. 0° 25′ 0″ by account. The promontory of Usongora, due west, was about 15 miles.

Ubagwe, Western Unyamwezi, Central Africa,
April 24th, 1876.

We departed from the capital of Karagwe with very brave intentions and high aspirations. We had discovered that the Kagera formed a great lake about 80 miles in length and from 5 to 14 miles in breadth, and that at Kishakka it was still a powerful, deep-flowing stream, while reports from natives and Arabs had created curious ideas within our minds as to the fountain-head of this noble river. Imbued with the thought that by journeying a sufficient distance along its right bank we might discover this source, we made ample preparations for crossing a wide wilderness, packed ten days' provisions of grain on the shoulders of each man of the expedition, and on the 27th of March set out for the uninhabited land. On the second day of our departure from the Karagwe capital we came to the east side of a lake, a long, narrow, winding body of water. We marched along its eastern shore for three days, a distance of 36 miles; on the fourth and fifth days an obstructing ridge shut it from our view while marching, but by occasionally surmounting the obstacle I managed to obtain views of its stream-like water, still extending south and south-west. On the sixth day we came to Ubimba, the frontier of Karagwe, where, behind a ridge, which extends between Ubimba and the lake, we saw the extreme south end of the lake we had so long followed. From a point of observation near Ubimba we saw also a decided change in the formation of the broad valley of the Kagera. The mountainous ridges bounding the western shore of the Kagera, which, extending from the Mpo-

* When in Unyoro we heard of a large salt-district in this direction.—J. A. G.

roro south, continue on a south-by-west course, became broken and confused in Southern Kishakka, and were penetrated from the north-west by a wide valley, through which issued into the Kagera a lake-like river called Akanyaru. South-west was seen the course of the Kagera, which, above the confluence of the Akanyaru with it was only a swift-flowing stream of no very great depth or breadth. Such a river I thought might well be created by the drainage of Eastern Urundi and Western Ubba. My attention was drawn from the Kagera to the lake-like stream of Akanyaru, and several natives stated to me while looking towards it that it was an effluent of the Kagera, and that it emptied into the Albert Niyanza. Such an extraordinary statement as this should not be received and transmitted from me to you as a fact without my being able to corroborate it on personal authority. Exploration of the mouth of the Akanyaru proves that the Akanyaru is not an effluent, but is an affluent, of the Kagera. Beyond the mouth of the Akanyaru I dared not go, as the natives of Kishakka on the left bank, and Ugufu on the right bank, are a great deal too wild. I find that the long-legged race inhabiting the countries west of Uganda, Karagwe, and Uui, have a deadly aversion to strangers. The sight even of a strange dog seems sufficient to send them into a mad rage and paroxysms of spear-shaking and bow-bending. They are all kin to the long-legged mortals of Bambireh, who sounded the war-cry at the mere sight of our inoffensive exploring boat floating on the Victoria Lake. They are so dreadfully afraid of losing their cattle, that if one cow dies from sickness the whole country is searched to discover the stranger who has bewitched the animal to death, and, if such a person be found, his life is forfeit to the purblind, small-brained natives. Human beings frequently astonish one another in all countries with their hobbies, and by showing excessive fondness for gold, horses, dogs, cats, clothes, birds, &c., but the love which the Wasongora, Wanyankori, Wa-Ruanda, Wa-Kishakka, Wagufu, Wanyambo, and Watusi, exhibit for their cattle is an extreme, eccentric, and miser-like affection. A stranger might die in any of those countries for lack of one drop of milk. Generous and sweet-tempered as Rumanika proved himself, he never offered me even one teaspoonful during the time I was with him, and, had he given me a can, his people would have torn him limb from limb. From this excessive love for their cattle springs their hostility to strangers, which arises from a dread of evil or fear of danger to the kine. By maintaining a strict quarantine, and a system of exclusiveness, they hope to ward off all evil and sudden disaster. By comparing the information derived from natives of Ubimba, Ugufu, Kishakka, Urundi, and Ruanda, I am able to give you additional details of the source and course of the Kagera River, and I hold out to myself some small hope that in a few months from the present date I may be able to explore from another quarter a tract of country which, hypothetically, I believe contains the fountain-head of this river. Until that period let the following stand for the utmost of our knowledge of it. From a ridge near Mlagata Hot Springs, having an altitude of 6500 feet above the ocean, I obtained a view of the Ufumbiro Mountains, which have a height of about 12,000 feet. This group consists of two sugar-loaf cones and a ridge-like mass, and is situated about 40 geographical miles W.N.W. from Mlagata, forming a barrier at that spot between Mpororo and Ruanda. The course of all the main ridges and valleys from Ruanda to the Victoria Niyanza appears to be south by west. Nay, you may say that from Alexandria to the Nyassa Lake, the central portion of Africa seems to be formed into ridges, deep troughs, basins, or valleys, the length of which is from north by east to south by west, or from north-east to south-west. Regard the course of the Nile from Lake Albert to Alexandria, the position of Lakes Albert, Tanganyika, and Nyassa, as well as the Victoria Lake. Follow the course of the Mokattam range of mountains through Nubia, Abyssinia, Galla, Masai, and Usa-

gara; trace the plateaux of Masai, Unyamwezi, Urori, Ubisa, south to the Bechuana country, and you will perceive that the general trend of almost all the rivers, lakes, mountains, basins, and plateaux is from north-easterly to south-westerly. On a reduced scale it is even so with all the mountain-ridges and valleys between the Lakes Victoria and Albert. It seems as if the throes which Africa suffered—during that grand convulsion which tore her asunder heaved up these stupendous ridges, and sunk those capacious basins now filled with lengthy and broad expanses of crystal clear water—were keenest and severest about these lake-regions; for here the mountains are higher and the valleys deeper and narrower. We have no longer the wide, billowy plateau, the successive swells of which make travel and exploration tedious, but lines of mountains of enormous frame, separated from each other by deep, narrow valleys, with a hundred geological wonders presented to the view at a glance. From Mlagata Mountain, while looking towards the Ufumbiro cones, there were visible three lofty ridges separated by as many broad valleys. First was the Ishango and Muvari Ridge, west of the Kagera Lake and Valley, and west of this were two ridges, with the valley of Muvari between the two easternmost, and the valley of Ruanda between the two westernmost. The two latter appear to run parallel with each other from east and west of the Ufumbiro Mountains, and shut in the valley of the Ni Nawarango or Nawarongo River, which, rising in the Ufumbiro Mountains, flows south by west between Muvari and Ruanda, and enters the Akanyaru Lake, which is 30 by 20 miles in extent. From the Akanyaru Lake issues the Akanyaru River, between Ugufu and Kishakka, into the Kagera. The Kagera Proper, coming from the south-west, also enters the Akanyaru Lake, but leaves it south of Ugufu, and takes a curve north-easterly between Ugufu and Western Usui. West of Akanyaru I could obtain no certain intelligence. I have heard of another large lake lying west, but what connection it has with the Kagera, or whether it has any, I cannot learn definitely. One says that is an arm of Luta Nzige or Lake Albert, another declares it to be a separate water. Whatever it be, I trust I shall be able to discover at a later period. With the best intentions to prosecute my explorations along the Kagera, I was paralysed by famine in Usui and the hostility of the Warundi, and was therefore obliged to abandon exploration from this side of the Tanganyika. Summing up all the chances remaining for me to do good work without expending vainly my goods and the health and energy left in me, I saw it was useless to sit down and launch invectives against the intractable natives, and that it was far better and more manly to hurry on to other regions, and try Lake Albert by another route from the opposite quarter. You will perceive by this letter that I am now in Western Unyamwezi, about fifteen days' journey from Ujiji. What I propose doing now is to proceed quickly to Ujiji, then explore the Tanganyika in my boat, and from Uzige strike north to the Albert; and, if that road be not open, to cross the Tanganyika and travel north by a circuitous course to effect the exploration of the Albert. It may not be actually necessary to explore that lake, for Gordon or some of his officers may have accomplished the work, but I have no means of knowing whether they have done so or not; it therefore remains for me, if the feat be possible, to circumnavigate it. If it is not, I shall strike out for other regions, and continue exploration elsewhere, until my poverty of goods warns me to return. By the same bearer which conveys this letter to the coast I send four others, which have been kept by me until I had an opportunity to send them. Three, at least, I expected to put in person into the hands of one of Gordon's officers; but it was not fated to be so. From Ujiji I shall send the duplicates of these letters to the coast; and, before I quite leave that port, I expect to possess other geographical items to transmit to you.

Gordon Pasha was kind enough to send me a 'Daily Telegraph' of Decem-

ber 24, 1874, and a 'Pall Mall Gazette' of the same month, which I received in Uganda just before starting for the Albert Niyanza. In the 'Daily Telegraph' I saw a short letter from Cameron, dated May 3, 1873, wherein he says he has discovered the outlet of the Tanganyika to be the Lukuga. Cameron has been fortunate and energetic, and deserves credit for the discovery. But he says he has not quite circumnavigated the Tanganyika, because he did not think it worth while, after discovering the Lukuga. It may be, Cameron, by this omission, has left me something to discover in this quarter; but whether or not, the *Lady Alice* shall not quit the waters of that lake until I have finished the two-thirds left unvisited by me on my first expedition. In the 'Pall Mall Gazette' I read a more startling statement, which deserves from me as flat a contradiction as no doubt it has received from Colonel Grant. The article stated that Colonel Long, of the Egyptain service, had declared that he had just returned from a visit to the King of Uganda, and had discovered to his surprise that Lake Victoria was a body of water about 12 miles in width! Now, I do know it as a fact that Colonel Long, or Long Bey, was in Uganda in July, 1873; but if he states that the Victoria Niyanza is only 12 miles in width, he states what every snub-nosed urchin in Uganda would declare to be most astounding nonsense. The width of 12 miles is what I would give to Murchison Bay—a portion of which is visible from Kibuga, one of the Emperor's capitals. If Monsieur Linant de Bellefonds, of the Egyptian service, who *discovered* me in Uganda, is now in Europe, he is requested to publish his opinion of Lake Victoria, even from what he saw of it from Usavara. The 'Pall Mall Gazette' adds that it was always the opinion of Captain Burton that Speke had exaggerated the extent of Lake Victoria. Last year I sent you a map of the southern, eastern, northern, and north-west coasts of Lake Victoria. Enclosed in this packet you will find a sketch-map of the southwest coast, with which you may compare Speke's hypothetical outline of the Victoria Lake, and judge for yourselves whether Speke has been guilty of much exaggeration.

HENRY M. STANLEY.

Anglo-American Expedition Central Africa,
April 18th, 1876.

MY DEAR PARENTS,—My heart yearns to you and home. It is now one year and five months since I heard a single word from you. I received your letters the day we left the coast. Since then Mr. S. received some papers from Colonel Gordon at Gondokoro in Egypt; and that is all we know about our homes. God only knows what has happened. There is no one knows the Pococks here, or Cookham Woods. I wrote a letter to you and Bill when we arrived in Uganda. Mr. S. was gone to the Sultan. Three months I was left alone with the goods. We were in Uganda five months—a land flowing with milk and honey. We then went to the Albert Niyanza through Unyoro, escorted by 2000 Waganda sent by the Sultan. We thought of seeing some white men at the Albert Niyanza; we reached there and saw the Lake, but had to retreat in great haste. We marched for sixteen days from two o'clock in the morning until sunset—hungry and thirsty, weary, footsore; and when we halted we had no bed, but lay on the ground. I became very sick from fever, which I thought would have carried me off. But my time was not come. On the road we passed a fine mountain crowned with snow, and many beautiful streams feeding the Niyanza. I cannot say anything about the people. All I know, they are bad. They train large dogs to fight like tigers. We left Uganda on January 1, 1876, and returned to Uganda on the 17th. When we reached Uganda the Waganda left us, and we travelled on to Karagwe. We crossed the Kagera River, the main source of the Nile, and

drank of its waters. When we reached Karagwe we fell in with some Arabs —a lucky hit. We discovered a lake here 80 miles by 30. There are also hot-water springs near the fall of the Kagera River, the springs, six in number, boiling. We left Karagwe in March for the Wilderness of Nine Days. While we were at Karagwe I visited the King, to show him the boat. He asked me, "Was I English?" I said "Yes." He said, "Speke was English, and he was a good man, so you must be good also." Speke travelled here fifteen years ago; his name is all the rage in Uganda and Karagwe. We are now in the country of Usambera—good people, and plenty of food. We have been nearly a month in the Wilderness, with but little food. An Arab has travelled with us to here; he leaves us here for Unyanyembe, and we go to Ujiji—about one month's march. The Arab will bring our letters to the coast. I hope when we reach Ujiji to find some letters and papers from home. I am sometimes lonely. I have no one to talk to but black people. Although I can talk Swahili nearly as well as English, I can't find anything in their company to amuse me. There is no comfort in this part of the globe—hot sun and cold nights. We have crossed rivers and swamps, up to our waists in mud and water, for days and days. Then, when we reach camp, there is no kind sister to make your bed; but a nigger will throw down a lump of grass as you would to a pig. Then our food is like cattle-food in England. It consists of dried beans and peas, and Matama corn, such as donkeys eat. What would I give now for an old crust such as you give to sailors, or some pudding, properly cooked. But no one knows about that here. If you cannot eat, go without.

But, thank God, I enjoy good health. It is now three months since I had fever. I am strong and fat. In some places white men are thought cattle, in another they are great. There are many tribes of fine men, dressed in embogu-bark cloth. Many are naked; many are dressed in skins put about their shoulders. Many have long hair, others plait it in a thousand plaits, with beads sewn on; while the people of Uganda shave all off, and carry two spears and one shield, and the people of Karagwe use bows and arrows, and the people of Usui use one spear with which they spear a man or an ox—they don't throw it—while the people here use guns.

F. J. POCOCK.

III.—*Description of the Country and Natives of Port Moresby and Neighbourhood, New Guinea.* By OCTAVIUS C. STONE, F.R.G.S.

[*Read*, May 8th, 1876.]

IN a short note addressed to the President from Anuapata (Port Moresby), last December,* I gave some account of my experiences in the Peninsula of New Guinea, and stated that, owing to the great difficulty, and at other times utter impossibility, of procuring native carriers or guides, I and my party had been unable to penetrate more than 25 miles inland. I now take the liberty of sending you a more detailed account of my observations, regretting only that, in a geographical point of view, it should not embrace so much of the Peninsula as I had hoped to have seen and been able to describe.

* 'Proceedings' R. G. S., vol. xx. p. 266.

In a former letter from Somerset I hazarded the opinion that Timor ponies would be eminently suited to insure the success of any lengthened journey into the interior; and having since proved, to my satisfaction, the unreliable character of the natives to act as carriers, that opinion is now strengthened. As a cattle-country, the immediate neighbourhood of Anuapata is well adapted, and I would now venture to suggest the introduction of *goats* by any future Expedition proposing temporary location, as being one of the greatest boons it could import next to that of carrying power. They are hardy, breed quickly and plentifully, supplying some of the most nutritious diet for invalids and others.

Geographical Features.—When we arrived at Anuapata on the 29th of October, 1875, the hills around presented a barren and parched-up appearance. They jut out into the sea in a succession of low conical mounds, averaging 400 feet high, forming a range on either side of the harbour, and becoming higher the further they recede from it. Their formation is limestone, and mixed with a covering of the poorest soil are fragments of decayed coral, while the sides are strewn with pieces of rock, among which a red translucent sort of flint, called by the natives *vesika*, is predominant, and also a white non-auriferous quartz. A seam of plumbago runs along the eastern shores of Fairfax Harbour, continuing in a more or less pure condition for a couple of miles, and it is the only metal which I positively know exists. The three villages of Anuapata, Tanapata, and Elevara, containing a total population of nearly 700, are situated on the beach east of the harbour, at a distance of 2 miles from its opening; behind them extends a valley of the same length; while Mount Tapaharti, rising, like the keel of a boat, 750 feet high, closes it in. The sides of all these hills partake of the same barren nature, being partially covered by open forests of gum-trees (*Eucalypti*), averaging 8 or 10 yards apart, the intervening spaces growing coarse grass, 6 or 8 feet high, which is annually burnt down in the month of September, when it has become dried, like hay, from the excessive droughts and solar heat. Patches of dark-foliaged scrub or jungle usually clothe each mountain gully and ravine, at rare intervals the lower portion of the hill-sides being similarly adorned. These trees are alive with the songs of birds, among which parrots and doves, of various species, are the most common. The hills along the coast must have risen from the sea-level within a comparatively recent epoch, for shells, such as the *Chama, Strombus, Cypræa, Conus, Spondylus, Nerita,* &c., like those existing in the sea at the present day, are found at a height of no less than 600 feet. The whole country is broken up into hills, mountains, detached chains, and valleys,

such chains usually running nearly parallel with the coast, but becoming less regular and not so numerous as they approach it. Hence for the first 20 miles fairly fertile valleys and plains are not unfrequently met with, though the mountain-slopes, which may be said to occupy three-fourths of the entire area, still retain their unkindly barren and rocky nature. The land, nevertheless, becomes gradually more fertile as you approach the interior, and after passing the River Laroki, 10 miles distant, numerous mountain-streams and water-courses cut it up in various directions, assisting in no slight degree to the desired end. At the twentieth mile a total change in the character of the country is at once observable, and with it the bird-of-paradise (*Paradisea raggiana*) and two other species are immediately seen. The gum-trees and open country then give way to dense forests of tropical vegetation, tall trees, and undergrowth, which completely cover the northern ranges, excepting the upper part of Mount Owen Stanley, with one impenetrable mass of foliage. Their summits become rounder, less undulated, and their heights increase to 4000 feet as they near the great central backbone of the Peninsula, where Mount Owen Stanley rises in a double peak to a height of 13,205 feet. The face of this mighty rock is rent into a series of volcanic irregularities, crevices, and chasms, throwing out arms in a westerly direction, while what I take to be an extinct crater exists below the western peak. The more easterly of these peaks is called Bitoka, and the other Birika. A narrow gap, seen some 8 miles to the south, and in a nearly north-east direction from Anuapata, is the only one discernible in this imposing range, whose average height is about 8000 feet, and it is probably through this opening that the easiest way of crossing the Peninsula will be found. Native tracks are numerous in the open country, and likewise penetrate these interminable forests, winding sometimes over the hills and at others along the course of rushing streams, whose beds are full of many-coloured rocks, rounded by constant friction. Brick-red and green rocks are most conspicuous in the Vetura Rivulet, the former looking like marble, and being hard but exceedingly tough. White quartz is also common there, and in one place its bed is of a slaty nature, with veins of quartz running through it, nor are many of the rocks found therein free from similar streaks. This rivulet I have called Vetura, from the name of the mountain which supplies its first sources. Mount Vetura is situated 17 miles north-east of Port Moresby, and is, from its peculiar shape, an unfailing landmark. It forms the south-west point of the Vetura Range, whence it rises in a pagoda-shaped mound to a height of 1200 feet, the lower part being clothed with vegetation; while tufts of grass are seen

clinging to the bare rockwork above, which is worn into a succession of irregular steps, with vertical rents in them, though the strata run nearly horizontally. This range may be 2 miles wide and in length 8 or 10, curving round to the north-east, and forming on its west or inner side an amphitheatre of hills, 1000 feet high, which includes within it the district of Munikaira and several villages. Upon the summit, at a height of 1600 feet, is a table-land, sloping slightly inwards, covered at its southern extremity with gum-trees (*Eucalypti*), and then changing into dense scrub. The southern side rises from the valley beneath, like the walls of some leviathan fortress, and on the inner side the rocks fall perpendicularly for a distance of 200 feet,* whence grass-covered slopes trend towards the stream below. Leaping from the table-land over the tall cliffs is a cascade, called *mariahu*, which falls in one unbroken volume into the gorge that conducts its waters to the Vetura Rivulet.† This stream averages 15 yards wide, and when I saw it (in December) was 2 feet deep, running in a westerly direction with a current of 3 miles an hour, though after severe rains it is much swollen, overflowing its banks in many places, and assisting to give nutriment by this means to the belt of tall trees rising on either hand. A valley separates the most northerly point of Mount Astrolabe—*Variata*—from Vetura to its north, and through this winds the river, called Laroki, already mentioned, when it takes a turn northwards towards the high mountains. It is sometimes spoken of as the Manumanu by the inland tribe, flowing westward, and falling into the sea at the village of that name, situated at the mouth of the Usborne, in Redscar Bay, which is, no doubt, one and the same river, or a branch of it. On the authority of several natives I am informed that another branch of the same river empties itself into the sea at Karo, a village immediately to the south of Hood Point. The width where we crossed it, nearly 30 miles in a direct line from its mouth, was 35 yards, depth 6 feet, and current 4 miles an hour, while its waters must remain fresh until within a comparatively short distance of the sea. Owing to the force and depth of this current, our baggage could not be carried over, so a raft had to be constructed and firmly secured by long ropes before launching it on the rolling tide. The banks, which are of rich black soil, rise abruptly to a height varying from 4 to 10 feet above the surface. A few miles lower down, where I first came upon it, they were of the former height; hence, after heavy rains, it overflows at such places, creating swamps on its subsidence. A

* The appearance of this mountain reminded me of Gunib—Shamyl's stronghold in the Caucasus.

† After the manner of the Staubbach, near Interlachen, in Switzerland.

belt of trees on either side, some of whose trunks measure 4 feet in diameter and 100 feet high, growing perfectly erect and void of lower branches, marks the river's course. The river is nearly clear of snags and fallen trunks, but its rapidity and its numerous sharp windings condemn it for purposes of navigation, excepting perhaps to small steam-launches. The Vetura Rivulet flows into it a little west of the point at which we crossed, and it receives the waters of several smaller streams. Among these the Baikana, 6 miles on the track thither from Anuapata, 14 feet wide and 3 feet deep, may be mentioned. On the road to Mount Astrolabe, 9 miles in a E.N.E. direction, such another stream is crossed, flowing southwards towards Bootlers Inlet, as well as numerous dried-up watercourses, varying in size from mere ditches to ordinary brooks. During the rainy season these must all be, more or less, filled with water. Many parts of the country are divided into districts, which vary in name from the villages they respectively contain.

Native Cultivation.—The inhabitants of each village own the country for several miles around. The members of each family possess a plot of land as near as possible to their own homes, the boundaries of which are clearly defined and understood by their next neighbours, if not by the entire village. Either the whole or a part of this is neatly fenced in, and planted with bananas. In the neighbourhood of Anuapata the hill-sides are covered by such plantations, which must occupy a total area of some 350 acres. Yams and taros, disposed in very limited quantities among the bananas, constitute the remaining portion of the agricultural produce of Port Moresby. Owing, however, to the inferiority of the soil, many fail to bear, and none attain that perfection which we find them doing in the interior. There the frequent rains among the mountains cause the soil to become very life-giving and nutritious, so that the land possesses all the qualifications necessary to its successful cultivation. Bananas grow luxuriantly; while sugar-cane, yams, taros, and sweet potatoes attain an immense size. The breadfruit-tree (*Gardenia edulis*), betel (*Areca catechu*), mango (*Mangifera indica*), called *yahi* by the natives, and sago-palm (*Sagus Rumphii*), are indigenous, though the latter is scarce, abounding at Ilema and further north-west in large quantities. Tobacco is cultivated in the interior; and I likewise found chilies, cucumbers, water-melons, vegetable-marrows, and small purple grapes. A rose-coloured stone-fruit, resembling an apple in form and taste, having a white pulpy interior, called by the natives *maita*, was plentiful. Wild oranges grow sparsely in the vicinity of Yule Island (*Roro*), and the nutmeg-tree (*Myristica fragrans*), is abundant more to the west, near the

Fly River. That other tropical fruits and spices would flourish in the interior of the Peninsula there is little doubt, for both soil and climate seem essentially suited to the cultivation of coffee. Of the sugar-cane there are already eight indigenous sorts; and by adopting the terrace-system of irrigation, rice might be made to form an important item in her productions. In the open land a cotton-tree (*Bombax pentandrum*) is not uncommon, and the growth of the plant might be attended with satisfactory results. Coco-nut groves are usually found overshadowing the coast-villages of the Peninsula, though, in proportion to the population, who partly subsist upon the fruit, they are generally inadequate to their requirements. In the neighbourhood of Hood Point, however, they are particularly plentiful; hence annual trading voyages are made by the Hood Point natives in the months from October to January to Anuapata, bringing coco-nuts from the south, and sago from the north, which they chiefly exchange for earthenware pottery. In times of extremity they are forced to subsist upon the mangrove fruit.

Races.—The race inhabiting the Eastern Peninsula of New Guinea differs materially in physique from that peopling the main body of the island westwards. Their colour varies from light yellowish-brown to rich coffee-brown; whereas the pure Papuan about the Fly River has an intensely dark brown skin, but not nearly black—a shade, indeed, similar to the islanders of the Loyalty Group. In stature, the race of the Eastern Peninsula are, as a rule, not so tall; and in disposition are less warlike; but they are endowed with a greater degree of intelligence, that only requires training to raise them from their present lethargy into civilisation. It is a notable fact, notwithstanding, that the Papuans appear to possess the art of figure-carving, colouring, and imitation in a greater measure than the more docile race; and it would not surprise me to find, when more is known of them, that, but for their cannibal propensities, they are more enlightened than most savage tribes.

So little intercourse, however, has been had with them, that I shall be content for the present to confine my observations to the people among whom I have lately been residing.

It is difficult to draw any positive conclusion as to where the light race of the Peninsula first came from, or at what remote period of time such influx took place. That they are not the true aboriginals of the island is as certain as that they are not pure Malays. Their character is entirely different from that of the quiet, apathetic, reserved, and undemonstrative Malay; and though some are of the same yellowish com-

plexion, the great majority are very much darker. The hair of the Malay is black, long, and straight; but in the race we are considering, it is black, and sometimes auburn, long, and frizzed; varying in colour, though not so much in form, among the different tribes. Their hair resembles mostly that of the Eastern Polynesians, though it is more frizzed; their complexions are darker; they are more vivacious, and the nose in some is slightly less aquiline.

The construction of their language is similar, in some instances, to that of Eastern Polynesia; several words being also alike, while others are evidently derived from it.* I am therefore induced to believe that the people now inhabiting the south-east portion of New Guinea have in some far distant time made their way thither from *the eastern islands* of the Pacific, residing at various places on their way, until their population becoming too numerous, or from other causes, they or their offspring were compelled to wend their way further westward. On landing, they have driven many of the aborigines from the sea-coast; and afterwards multiplying in population, have extended their invasion to the interior, until the whole Eastern Peninsula, so far as I have seen and believe, is now peopled by them. Intermarriages between these two peoples must have taken place, and it is the result of this mixture which has placed thereon a race far above the ordinary savage in both physical and moral attributes.

Tribal Divisions.—This Papua-Malay race is divided into many tribes, as we find Scotland was formerly into so many clans, each speaking a distinct language or dialect—a circumstance which may be accounted for in two ways. Either they have landed at various periods; or they have lived in such a state of disunion one with another that their languages have ceased to bear more than a faint resemblance to each other, and in some cases none whatever. Of these two theories I am inclined to believe the former. It is impossible at present to say how many tribes the

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* As in Polynesia, two consonants never come together, but are invariably separated by a vowel. The following examples are some to which I refer above:—

English.	*Motu.*	*E. Polynesian.*
1. Father.	tamana.	tama.
2. Mother.	tinana.	tina.
3. Animal.	manu.	manu.
4. Death.	mati.	mati.
5. Eye.	mata.	mata.
6. Woman.	haini.	vaini.
7. Fire.	laki.	lafi.
8. Arm.	ima.	lima.
9. Pitcher.	uro.	uro.
10. To walk.	laka.	laka.

Peninsula contains; but if we place the unknown portions against those occupied by tribes whose names and the approximate position of whose country I herewith give, we shall have a total number of nearly twenty, though this would not represent more than half the number of dialects spoken. For its size New Guinea will be found to possess more languages and dialects than any other country, probably, in the world.

Commencing at the north of the Gulf of Papua, we find:—

1stly. The Ilema tribe, extending along the coast from Muro, a little north of Freshwater Bay, to and including Oiabu, situated about 10 miles above Yule Island (*Roro*), distance 50 miles.

2ndly. The Maiva tribe, extending coastwise from Oiabu, to and including Kapatsi, situated to the west of the Manumanu (Usborne) River, distance 45 miles.

3rdly. The Motu tribe, extending along the coast from Kapatsi, to and including Kapakapa (close to Round Head), distance 60 miles.

4thly. The Koitapu tribe, living on eminences overlooking the sea, and occupying the country of the Motu.

5thly. The Kirapuno* tribe, extending along the sea-coast from Kapakapa to Muru, distance about 40 miles.

6thly. The Mountain tribe, called Koiari by the Motu, and Kuni by the Kirapuna, are the most widely diffused, occupying a large area in the interior, the limits of which lengthways are uncertain, but which includes the whole country lying behind Anuapata so far as Mount Owen Stanley, if not further.

These are the tribes with whom I have come in contact during my travels in the Peninsula. The Ilema, Maiva, Motu, and Kirapuno speak perfectly distinct languages; while the Koitapu and Koiari are dialects one of the other, though quite dissimilar to any of the remaining four just named.

West of and adjoining Ilema is the Namau Papuan tribe, spoken of by the Motu with great abhorrence, as being given to cannibalism. Their country extends from Muro to Ipiko, one of the furthest points westwards to which the trading-canoes of the Motu ever go, and near to which is a large river that, in all probability, is the Aird. Not far from that point the country of the Daudó Papuan commences.

Each Papua-Malay tribe either varies slightly in physique, or has some peculiar characteristic of its own in dress, manners, or usage, whereby it can be readily distinguished from another. In dress alone, for instance, the Kirapuno differs from the Motu

* The appellation of this tribe is doubtful, although I believe it to be correct as above named.

in the substitution of a yellow-stained belt for a plain uncoloured one, and in a shell being suspended by a back-lock of hair. The Koiari and Koitapu wear shells similarly suspended, only by two or three front locks, instead of one back one, and a head-dress made from the fur of the cuscus, as well as a head-cloth is peculiar to them; but the latter article is not so generally worn by the Koiari. The Motu wear no shells suspended in this way; while the Ilema and Maiva may be distinguished by their finely-netted collars and belts, and the Ilema by their shell-wristlets, &c. The tattooing likewise differs among the various tribes.

It is with the Ilema that we first see certain distinct characteristics of both races blending into one. There the spear, hitherto the war-weapon of the Peninsula, is first thrown aside, and the bow and arrow of the Papuan adopted in its place, made, however, of dark smooth cocoanut-wood, instead of the ribbed bamboo. There, too, the cannibal habits of their western neighbours cease, yet they do not attain to that nice sense of taste peculiar among those to the east which despises the flesh of dogs and rats. Polygamy is common among them, as with the Papuans, though this is the exception among the Eastern race. They vary in depth of colour, some being as light as any Motu, while the majority are half a shade darker. Having briefly noted certain characteristics of this tribe common to both races, I now propose to give some account of the Motu and others among whom I principally resided.

The Motu Tribe.—This tribe is short of stature, the average height of the men being only 5 feet 4 inches, and of the women 4 feet 11½ inches respectively, while the girth round the chest of the former averages 2 feet 9 inches. The colour of their skin varies in different individuals, though not so much as it does among the Kirapuno, the lightest resembling in depth of shade a Portuguese, and the darkest being of a chocolate colour. In the children the hair is black, and often straight or in ringlets, though I have seen it in some few instances approaching the woolly head of the negro. In the young men it might be taken for black by the general observer, though it is usually black only near the roots, fading off towards the extremities to a burnt sienna tint, more noticeable when the sun shines upon it. It is chiefly worn frizzed out into a light airy mass, projecting 6 inches round the cranium, for which purpose a frizzing-fork or *iduari* is constantly worn in it. The elderly men have shorter hair, which becomes thinner with age, and either takes the form of dark curving locks, leaves the top part of the head naked, or in some instances turns grey. That of the women is the same; but on the death of a husband it is skilfully shaved off by a piece of shell, though allowed to grow again. Their features are rather

rounder than those of the men. Like the other coast-tribes I have mentioned, the men wear no hair on the face, the roots of which are artificially extracted, leaving only the eyelashes. The young men are slightly built but well proportioned, athletic in appearance, and as a rule not bad-looking, and intelligent. The Mongolian form of eye is just perceptible in a very few, but in each tribe its colour is chestnut. The forehead is high, and not so flat as in a European, curving sharply at its junction with the cranium; but it is not prominent. The face is ovaliform, and the maxillary profile only moderately prognathous. The nose is aquiline, but inclined to thickness, having the apex rounded off and the nostrils very slightly distended, while the true Roman shape is occasionally met with. The ears are small, mouth rather large, lips of the medium thickness and well formed, feet and hands large. In one or two per cent. of the population the Jewish type of feature among the sterner sex is unmistakable, though in the others there is no similarity whatever. On the islands adjoining the mainland to the west of the Gulf, among the Torres Straits islanders or Kulkaliga race, which is more allied to the Papuan, I observed this type more frequently presenting itself.

The Koiari.—In this tribe the features likewise differ, but the colour of the skin is more uniform, the shade not varying perceptibly from the darker among the Motu. They may be classed into two types, the one having aquiline and the other flatter noses, with nostrils more distended. In every case the forehead is high, the cheekbones slightly prominent, and the face generally elongated, mouth large, and lips somewhat thicker than those of the Motu. Their teeth are discoloured black by betel-chewing; and the chin is finely shaped, several wearing a short curly beard, whiskers, and moustachios. The average height of the men is 5 feet 3 inches, and of the women 4 feet 9½ inches; while the Koitapu, who next approach them in manners and general appearance, measure only 5 feet 1 inch and 4 feet 8 inches respectively; but although shorter of stature than the Motu, they are more thickly-built, muscular, and powerful-looking men. They are more generously disposed; equally cheerful; evidently witty, energetic, and quick to comprehend, though timid at first of strangers. Two men alone differed in the manner of wearing their hair from all the rest I have seen or heard of as inhabiting the Peninsula, the one being matted like a mop, after the manner of the Kulkaliga race, and the other consisting of a series of small tufts covering a head of long, frizzed hair. In both cases the skin was darker, though at first sight imperceptibly so, and the nose was flatter, otherwise little difference could be traced in their physiognomies from the

remainder of the Koiari. Although in neither case the hair grew naturally so, but was simply the manner of dressing it, the inference might reasonably be drawn that they were either imitating in this respect the fashion of a former people inhabiting that part of the Peninsula, or that they had journeyed among a distant people by sea, which to a mountain-people is at least improbable.

The Ilema.—The Ilema are taller, and generally slightly darker than the Motu, the average height of the men being 5 feet 5½ inches, and of the women 5 feet 1 inch. Their features are rather coarser, varying in form and expression, and their hair is blacker. It is worn parted across the cranium from ear to ear, when it is frizzed out in front and behind into light wavy bunches. They are industrious cultivators of the soil, and their country is productive in sago, and all ordinary vegetables and fruits common to the country. Those whom I met exhibited great friendship, which in some instances almost amounted to affection, and they were far more diligent than the Motu. A tradition current among the latter people states that tobacco or *kuku* was first introduced from their country by Motu trading-canoes, probably about one hundred years ago.

The Maiva.—The Maiva resemble the Ilema in physique more than they do the Motu, while their average height is the same. Several dialects are spoken among them; that of Yule Island (*Roro*) being very dissimilar to others spoken on the mainland. Indeed, the Roro natives are lighter; and vary sufficiently in physique from those on the mainland to warrant the conclusion that they must have landed there at a more recent date. What would assist in supporting this opinion is that, whereas the district of Roro to the north, Lavel to the south, and Derena to the west, belong to the present inhabitants; the district of Boira, to the east, has been conquered from them by the inhabitants of Mou, a village situated on the mainland opposite. The Maiva proper appear also to be more hospitable than the islanders or than the Motu.

The Kirapuno.—Without doubt the most handsome tribe, not only in the Peninsula, but in the whole of New Guinea, is the Kirapuno peopling the neighbourhood of Hood Point. The colour of the hair first attracts the attention, being among the children of a light golden colour, and among the young men and women of a rich auburn, decreasing in brilliancy with age, so that an elderly man frequently appears to have black hair, although on closer examination it is generally found to retain a reddish tint.* The hair grows in ringlets or curling locks,

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* Among the Polynesians a preparation of lime is sometimes applied to the hair, which turns it yellow; but I cannot find that the Kirapuno adopt or are cognizant of this process.

which, combined with its colour, the comparative fairness of their skins, their symmetrical features, and the fine proportions of their bodies, constitute them a people of surpassing beauty. This, however, is an attribute seldom enjoyed by the women or elderly men, although as children they are pictures of loveliness. I have seen an Albino among this people as fair as any European; similar freaks of Nature being not unfrequent among the Polynesians. The weapons ordinarily used by them are the spear, stone-club, and sword-club or *paru*, 4 feet long, made of a black wood called *orta* by the Motu, and partially ornamented.

General Character of the Tribes.—The general character of these tribes differs widely from that of the pure Malay, and to a less extent from that of the Polynesian, which is chiefly owing to intermarriages with the latter; but is, no doubt, attributable in some measure to unaccustomed atmospheric and dietary influences caused by change of location. They are a merry and laughter-loving people, fond of speaking, and loving a joke when not played in a too practical form upon themselves; but are hot of temper and quick to resent a supposed injury, though soon reconciled, and I have known them to bring some trifling present as a sort of apology for any hastiness on their part. They are fairly moral, but by no means modest; clean in their habits, particularly so in their eating, and generally active. They are peacefully disposed towards the white man when they understand his pacific intentions, and soon become attached. The women are not debased, as we find them among the Papuan race, but mix freely with the men, attending to their domestic occupations, and being the reverse of shy at foreigners when they have once got accustomed to their sight. Their skin, unlike that of the Kulkaliga and Papuan races, has no disagreeable odour attached to it; and they are fond of all sweet-scented herbs, with which they often decorate their arms and heads. The women are great talkers, taking an active part in every disturbance and discussion of interest, and making the hardest and most determined bargains, so that where the husband fails his wife generally succeeds. When allowed liberties, they do not fail to take advantage; and at Port Moresby, in particular, they are accomplished thieves, inveterate liars, confirmed beggars, and ungenerous to a degree.* These are their four worst characteristics; but we found those in the interior, and other visitors from north and south, quite different, though whether naturally so or through fear I cannot say. Whoever the settler, a firm and determined bearing ought to

* Even if at death's door, for want of food, they would *give* you nothing.

be exercised from the first, so as to prevent the natives from becoming too familiar, or any non-observance of this may lead to serious consequences with unscrupulous white people who would not hesitate to shoot down those who had been accustomed to rank themselves among the privileged. Although hasty, the term "savage," as applied to these people, is a total misnomer, for they are neither cannibals, nor possess other degrading qualities which mark most savage tribes.

Both sexes are very vain of their outward appearance, oiling their bodies, and adorning themselves with shell-, feather-, and bone-ornaments, and, on all festive occasions, each trying to outvie the other in his scanty wardrobe. They are friendly with other tribes,* although none feel perfectly secure in the country of another; with what degree of reason, however, I am unable to say, as they always appear to be hospitably treated, judging from those cases which have come under my observation. It is certain that the inland tribe is regarded by the Motu with a sort of superstitious dread, notwithstanding that peace was formally made between them a couple of years ago, as they found it would be advantageous for both. Long droughts, contrary winds, or any calamity such as they might bring about, is often attributed to them.

Intellectual Characteristics.—The Motu have a measure equaling nearly one fathom, called *dimun*, calculated by the outstretched arms, as in Polynesia. Their year consists of thirteen months, duly named, and calculated from the new moons; but they are not subdivided, excepting into half-years, named respectively after the north-west and south-east monsoons. Their numerals extend to one million *kerebu*, while the Papuans and Kulkaliga count only up to three. Their surnames generally have some peculiar signification, as, for instance, those of the three Anuapata chiefs, Ila, [illegible]uba, and Boi, meaning respectively tomahawk, sky, and night. Each tree, shrub, flower, or particular kind of grass, is distinctly named, as well as the winds and many of the stars. This alone shows some advancement towards civilisation; and their inquisitiveness concerning any new thing they see or hear marks them as an intellectual people rather than the reverse. They dislike the dark races, and appreciate the beauty of the fairest among them. This may be as great a reason for their friendliness to the white man as for the dislike to the light-coloured races by the Papuans.

* The only exception that I know of is in respect to the inhabitants of Hula (not the whole Kirapuno tribe), who hold the Koiari and Koitapu as their enemies. They speared and killed a Koitapu at Papakori (near Anuapata) a fortnight before I left.

Occupations and Manufactures.—The duties of the Anuapata (Motu) women consist in bringing firewood, also water in earthenware vessels or *hordus*, from a small, and the only, running stream half-a-mile away; attending to the cooking, which is done on the raised floor inside their houses; trimming the banana-plants, and tying up the bunches; carrying fruit and vegetables from their plantations in large net-bags or *kiapas* suspended from the head; in making pottery, and attending to the children. Usually they make two journeys daily for water, the pitcher, which contains as much as an ordinary bucket, being carried upon the shoulder without any apparent effort. The duties of the men are less arduous, consisting of hunting wallabies or *mikanis* (a small species of kangaroo), which are very plentiful; digging, and attending to the fencing of their plantations or *umas;* making twine or *varu* from the fibre of the pandanus-leaf; in making fishing-nets or *rekis;* and in manufacturing body-ornaments, in which they are assisted by the women and children. They fish with these nets, but are not so expert as the Kirapuno, who make that one of their chief occupations, and even sell fish to the Motu themselves for pottery when they call there on their trading voyages. The fishing-spear or *karaut*, resembling a besom, is also sometimes used.

The art of making earthenware pottery is confined to the Motu, and forms the staple trade of their country, whereby natives are induced to come from long distances, both north and south, for the purpose of procuring some, which they are enabled to do by the sale of their agricultural produce. They are made of a red or slate-coloured clay, the top and bottom of the pitchers being worked separately over an earthenware mould, and, when in a damp state, patted together by means of a flat board, assuming when finished two globular forms, differing only in the size of the aperture. They are then baked in an open fire constructed on the beach.

That called a *hordu*, for carrying water, has a less aperture than a *ura* used for cooking, both being fitted with a lip. Their diameter averages 14 inches, but I have seen some in the chiefs' houses as large as 24 inches. A bowl or *nao* is the third and last form of pottery manufactured by this interesting people. They are mechanicians, making drilling-machines on precisely the same principle as those in use among the Polynesians. The fly-wheel, which is of wood, is fastened to an upright spindle, when, by means of a twisted cord attached to the top, it is made to revolve to and fro. The cutting-tool used is flint or *vesika*, with which the hardest shells can be perforated. The Ilema make neater drills, having stone fly-wheels instead of wood.

Villages and Population.—All the villages of the coast-tribes are built so low down upon the beach that, at high-water, the sea flows under the houses, which are consequently built upon poles let into the shingles, so that the floors are from 6 to 10 feet above. These villages may average 4 miles apart, each containing sixty houses, and six inhabitants to the house, the distance between them varying from one village in 30 miles to three villages in half-a-mile, which, reckoning the coast-line of the Peninsula at 800 miles,* would give a population of 72,000. The inland villages are thinly scattered, and are not so large. The largest we saw did not contain more than fifteen houses, and the smallest only five houses. Dividing the Koiari country into sections of 10 miles square, we might find ten villages in each containing the same number of houses, which, with an average of six inhabitants per house, would give us a population of 600 to 100 square miles; or taking the area of the Peninsula at 21,000 square miles, would give an inland population of 126,000. If this be added to the sea-coast population, it would make the total peninsular population to number 198,000, or nearly ten persons to the square mile. This I believe to be the only method by which an approximate estimate can be obtained. The inland villages are not often isolated, but are built comparatively close to each other, so that many miles may frequently be passed by without seeing any signs of one, when several will be suddenly seen on the surrounding hill-tops, or high up on their slopes, but never in the valleys.

Habitations.—The Motu houses are generally arranged in a single, but very irregular, line along the beach, with the back facing the sea, and the front inland. They average 25 feet long by 15 feet wide, and 12 feet from the floor to the centre of the roof, which slopes downwards on either side, the whole village resembling a quantity of pigeon-cotes placed upon poles. The sides, ends, and roof, are thatched with long coarse grass, and the floors are made of wide boards, generally obtained from the sides of some old canoe. A landing projects out in a line with the floor on the land side, over which is a grass verandah, reached by a roughly-constructed ladder 6 feet wide. Access is had to the interior by an open doorway from the landing; and at the reverse or sea end is an aperture leading on to a smaller landing closed in on all sides, which serves as a pantry, and at the same time lets in sufficient light for the requirements of the inmates. From the irregularity with which they are built they at first present a tumble-down appearance, though, in reality, they are strong and substantial. The fire is made upon a

* This does not allow for numerous minor indentations.

quantity of old ashes, always kept in the centre of the floor, and the cooking-pots set in readiness upon them. The fire is lighted between three empty pitchers, which are placed so as to form a triangle, when another, containing the food to be cooked, is placed upon the trio. The inside beams support their hunting and war-weapons, sundry fishing-nets, net-bags filled with their most prized body-ornaments, and usually a drum, &c. The whole are neatly dispersed, and the interior is fairly clean, though, on the death of an inmate, the beams and other conspicuous places are blackened by smoke or lamp-black. The men refrain from eating until after their return from the chase, but at other times they have three regular meals a day in their own homes.

The Koiari houses usually face a common centre, or are built in rows facing one another, leaving an open space between, with the Chief's house at one end. Their size and general form much resemble those just described, being likewise built on poles, but the height of the floor from the ground does not generally exceed 4 feet. This floor is made of sago-palm stalks laid width-ways, the broad end of one being laid between the narrow end of the adjoining ones. The front is also made of sago-palm stalks placed vertically, and fitted with a door of the same material swinging upon hinges, constructed from certain creepers. This front, however, partakes of the nature of a partition, as it is placed 4 or 6 feet back, thus leaving a stage of such width whereon the traveller sleeps, and the inmates spend much of their time. Sheaves of grass 4 feet high are placed as ornaments at each end of the roof, and the whole is particularly clean and neat, though, from the necessarily uneven nature of the floor, it is less comfortable than a Motu house. Indeed, it is common to see a Koiari with huge hard swellings on either thigh derived simply from this cause. Each Koiari village contains one or more *kohora* or house, picturesquely built among the foliage of some tall tree, at a height of 30 or 35 feet above the ground, reached by a ladder of bamboos tied together. They seem to be thus raised aloft in order that *Vata*, the evil spirit, who both they, the Koitapu and Motu, fear, and who is supposed by them to wander about the surface of the earth during the dark hours of night, may have the greater difficulty in gaining a foothold. At the same time it answers all the purposes of a sentry or look-out station. The Koitapu houses resemble the Koiari, those of the chiefs being rather larger than the rest.

Religion, Superstition, Charms.—None of these tribes believe in a God, although they have some idea of a future state; for they will point over the sea, and say that after death their

spirits will inhabit the space above it called *Taurau*, drawing no distinction in that transitional state between the good and bad. This and the fear of *Vata* appear to constitute the only semblance to any religious feeling that exists among them; but notwithstanding this, they, but especially the inland tribe, are so light-hearted and free from care, that a happy contrast might be drawn between the feeling of contentedness pervading its community and that of many a European town. A few years ago they had no idea of any other land existing but their own, hence the date of their first settling in it must be remote. At rare intervals the sail of some distant ship would be spied on the horizon, but it was generally supposed to be a spirit passing over the surface of the deep. They are ready to attribute any extraordinary occurrence to supernatural agency either of man or of Vata, and when they saw rockets piercing the heavens they imagined the stars were being communicated with; one, descending near a chief's house, was placed in front of it as a charm. Stone charms are sometimes placed in the houses of the Motu to cure an invalid from sickness, or are placed in the plantations to make them more fruitful. Any peculiarly-shaped stone is treasured up for such a purpose, those I saw having been only a few inches long and shaped like an egg-glass. Perhaps the most valued charm is that worn in dance and war for giving them supernatural strength, endurance, and gracefulness. No inducement will make them part with these excepting in an isolated instance, such as after three months I was fortunate in finding. As these vary in different tribes, I will briefly describe those I have seen.

The Motu *kotsiva* is made of two rows of boars' tusks placed between a light frame 12 inches long, each row containing eleven sets of tusks, diminishing in size as they near the centre, and having their convex sides outwards. The whole are traversed by a longitudinal strip along the centre, and each end is hung with native ribbons of tappa. During fights it is held vertically in the mouth by these ribbons, so that it hangs suspended, and during dances it is carried in the mouth by the upper framework in a longitudinal position. The men only wear these charms.

The Koiari and Koitapu *Musikaka* are both alike, and always accompanies them, being ordinarily worn suspended from the neck. It is made of tortoiseshell, 12 inches long by 6 wide, each side being fitted with three sets of boars' tusks fastened on the edge with their concave sides outwards. Red seeds and a couple of shells ornament the front, while a piece of coconut-cloth, 9 inches wide, overlaid with feathers and fastened on behind, hangs down to a depth of 4 inches. A string of large

hollow seeds, which clang together, and a mouth-piece behind, complete this charm. It is used only in war, and when carried in the mouth their features, as though involuntarily, immediately assume a defiant expression.

The Kirapuno *kotsiva* consists of a split bamboo, 16 inches long and 2 wide, burnt in various devices, and partially decorated with feathers, the bamboo itself forming the mouthpiece on the inner end, whereby it is carried horizontally during dances. In war it is held vertically by a ribbon tied round the outer end.

I cannot make out that either the Maiva or Ilema believe in these charms.

Motu form of Government: the Chiefs.—Each village has its own great chief or *Loiapata*, but they have not the absolute power accorded to those bearing a similar title in the South Seas. Nor can I find that it is hereditary, but appears to be given to those who are feared the most by the people on account of some act of prowess through which they have distinguished themselves, as well as to others who by their good common sense and discretion have shown themselves superior in intellect to the majority of their fellow-men. On an average there is one chief to every hundred inhabitants of a village, and they are usually between forty and sixty years of age. Other than by the weight their words, or the veneration their age may command with the people, they are powerless to order, to punish, to quell a disturbance, or to make war; the women as well as the men having a voice in these matters. Notwithstanding this, their advice is generally taken in any matter concerning the interest of the village, or in any personal dispute. The chiefs own larger portions of land than the others, and attend to the plantations themselves, receiving no tax or tribute from those beneath them. Their undaunted air (especially among the Koiari) gives them a ready distinction, made still plainer by a shell forehead-ornament, or *musimusi*, attached by a string of red beads. No reception-houses are set apart by the Motu, Koiari, or Koitapu, as is the case among the Maiva, so that it becomes the duties of the chiefs to lodge and entertain the chief strangers from a distance, and they expect to be similarly treated when they go inland, or make journeys in their canoes to villages along the sea-coast. On such occasions many of the inhabitants go out either on foot or by boat, as the case may be, to meet and welcome the strangers; and when they leave, after a few days or weeks, the chiefs accompany them a short distance on their way back. For this hospitality a small present of vegetables, &c., is given, depending upon the chief produce in the country of the visitor. If he be a Koiari, he will give either yams, taros, sugar-cane, betel-nut, or sweet-

scented herbs; if he be a Kirapuno, he will give coco-nuts and fish—although he generally prefers remaining on his canoe; if he be an Ilema he will give sago and variegated crotons; and if a Maiva, he will give coco-nuts, vegetables, and a rose-coloured lime. The Motu chiefs (especially at Port Moresby) taking advantage of their position, and on account of the scarcity of food, will sometimes wait for hours in the hopes of obtaining something to eat. The Koiari have abundance, to which fact and the difference of climate I in a great measure attribute their physical superiority over the Motu. The sons of the chiefs accompany the others in their almost daily hunting excursions and in fishing, while the wife attends to the ordinary domestic duties of her sex.

Climate.—The high land surrounding Anuapata, its limestone formation, free as the neighbourhood is from marshy land, comparatively free as it is from mangroves, and open as the villages are to the sea-breezes, one would imagine a healthier locality need not be looked for. This is a mistake; and although I am unable to state the precise cause, yet the assertion is unfortunately too easy to prove. Among seventeen Rarotonga and Savage Island native teachers, with their wives (making a total of thirty-four), two-thirds of whom had only been located there or in the vicinity one year, and the remainder two and a half years, no less than seventeen deaths have occurred, nine of which took place between December, 1874, and November, 1875, from fever and ague.* Among those still living, attacks are of frequent occurrence. Speaking of my own small party, after a three months' residence two members suffered from occasional attacks and in one case rather severely. Roro (Yule Island) has been stated as healthy; it is of coral formation, hilly, and has every appearance of being so; but although I believe it to be more healthy than Port Moresby, yet the mainland opposite is, I feel convinced, less so. An eminent Italian naturalist, after a residence of some months upon the island, told me his health had not suffered, but his assistant had nevertheless been obliged to return to Europe in consequence of ill-health. Two gentlemen who since landed there, were after a three months' residence so altered in appearance that at first I scarcely recognised them. Both were suffering from fever and ague, and one was obliged to return. The climate is relaxing, and most averse to the healing of sores. The slightest scratch or bruise breaks

* The deaths among the teachers on the islands to the west of the Gulf have been as nearly as possible in the same proportion (17 I believe out of 31), exclusive of two couples murdered on Bampton Island. It would be well to verify these statistics by the published Reports of the London Missionary Society, who ought to lay them before future volunteers.

out into a fester, which increases in size, and lasts for months. From the merest bruise by a mangrove-root I have known the skin to break out into an open sore, four inches across, and I have personally experienced this in a less, though at the same time unpleasant degree.* Well-ventilated houses, good diet, and stimulants taken in moderation are, I feel confident, essentially necessary to the preservation of anything like health.

The year 1875 was an exceptionally fine one, but the climate is always very equable. In that year the variation at Anuapata was not more than 7° 40′ between the maximum temperatures of any month, and 3° 1′ between the minima of the same period. The hottest month was February, the thermometer at 9 o'clock in the morning averaging 90° 43′; and the coldest, at the same hour, was August, which averaged 83° 3′; while the average day-temperature for the year was 86° 71′, and night-temperature 73° 5′. The most rainy months were between November and May (exclusive), and the finest between April and December (exclusive). In April, when the greatest rainfall occurred, it registered 8·56 inches; and in November, when the least occurred, the gauge indicated 0·23 inches. July was the next finest month, when 0·35 inch fell; and in the three months following, and two previous ones, the total rainfall was only 9·35 inches; while the entire fall for the year was 34·44 inches. This, however, does not apply to the interior, where we frequently saw it raining, accompanied by forked lightning and terrific peals of thunder, although fine along the coast.

The south-east monsoon may be said to commence in May, although these winds are sometimes experienced in April, lasting with regularity, and often with considerable force, until the end of October. Light variable winds mark the months of November and December, when light north-westers continue with more or less regularity until the end of April.

The climate of the interior is more salubrious, but it is impossible to live in the valleys without injuring the constitution, on account of the excessive moisture of the atmosphere. As the morning sun rises above the hills, and pours its glow down into the valleys, the moisture from the rains and heavy dews is converted into vapour, which hangs suspended in the form of white clouds; and it is not until the upper air becomes sufficiently heated, that they lift themselves slowly, and gradually disperse. After the heavy rains of the preceding night this was an every-day scene from my camp near Matogorogoro,

* Quinine, cyanide of potassium, blue-stone, carbolic acid, and oil, will be found among the most useful articles in the medicine-chest—the first for fever, and the latter for sores.

situated in the district of Munikaira, at an elevation of 1100 feet, by aneroid measurement. It is on this account that all Koiari villages are built as high up on the mountain-tops as possible.*

Native Diseases.—Diseases among the natives are comparatively few. Some suffer from eczematous affections, though unconfined to any particular part of the body. Several are pitted with small-pox, which ranged virulently along the sea-coast about ten years ago. Elephantiasis is not wholly unknown, although cases of it are extremely scarce. Ulcers and sores are rather numerous. Measles have been introduced from civilised parts within the last year, through which a great number of natives have died; but, curiously, they seem nearly exempt from attacks of intermittent fever and ague, which are the Europeans' greatest foes. Acclimatisation may account for this difference in the constitution. Ringworm, and with the men a gap or gash in the top lip, are by no means uncommon among the Kirapuno. As a rule, these tribes appear to have no treatment for the sick, allowing them to take their chance of getting well or becoming worse, only devoting more attention to their wants than they are otherwise accustomed to do.

Death Customs.—When a Motu dies, whether man or woman, the deceased's nearest relatives go into mourning. This they do by either colouring the whole body and face black, or only partially so, depending upon what relation they held to the dead person, always adopting the deepest mourning for the nearest of kin. If the mourner is a very distant one, he will merely mark the face with a certain black streak, according to certain codes understood between themselves. A man putting on deep mourning will wear a belt and armlets of black cane: and all the coast-tribes I have mentioned adopt a similar system of blackening themselves on such occasions. The blacking used for this purpose is plumbago, or *okor*. The Koiari and Koitapu, on the contrary, whiten their faces with ashes on the death of a relation,† blackening them only for the sake of beautifying. The Maiva dress themselves in black cord belt and armlets; in addition to which, like the three just described, the chiefs, and those under them who possess one, wear on their heads a dress of black cassowary feathers, placed in such a manner as to nearly obscure the features. The Ilema men put on a wide yellow belt, armlets, wristlets, leglets, and anklets of plaited rattan, and a necklace or *kikita* of small bell-shaped seeds, having a bluish tint. The Kirapuno women wear similar seeds,

* The climate of the interior, no less than its tropical vegetation, reminded me of some parts in the interior of Java.

† The Kulkaliga and, I believe, the Papuans do likewise.

suspended by strings from the top part of the ear, and necklaces of the same; while I have seen them wearing, in addition, some of the bones of a deceased relative. The latter are either carried beneath the left arm by a string passed over the right shoulder, or else in a small netted bag or *wain.*

The graves of the Motu are dug just above the beach, upon the land-side of the village, and fronting the house in which deceased had lived; while over them rustle the leaves of the coco-nut trees as they fan to and fro in the breeze. When the body is placed in its last resting-place, the mourners stand around wailing, pulling the hair, and smiting their heads seemingly with some violence. It is then covered over with shingle, raised slightly above the level of the beach, and the ceremony is concluded.

Among the Koiari the deceased is laid out upon the floor of his own house for a couple of days, when he is either buried or placed upon the ground at some distance off. If, as it often happens, a rostrum exists in the village for accommodating any surplus of guests, or for speaking from, the body is laid upon that in preference. After a lapse of some days the joints are dislocated, when the skull is fastened to a rafter beneath the floor of the dwelling, and the remaining bones are wrapped up in some roughly-made matting, and similarly suspended. When their dead are buried, a grave is dug close to the house; and among the Koitapu, occasionally underneath. A circle of stones is then formed, 2 feet 6 inches in diameter, from which half-a-dozen sticks, 4 feet long, verge inwards, meeting at the top, upon which are hung all the earthly possessions of deceased, excepting the most valued body-ornaments.

Marriage.—The number of wives a Motu has is only limited to the amount of his riches; but notwithstanding this, it is quite the exception for a man to have more than one wife; and none that I am aware of have more than three. In Ilema it is not uncommon for a chief to possess as many as ten wives, but the Motu women raise such strong objections, that the men generally submit with a good grace. One case happened while I was in their country which illustrates the truth of this statement, wherein a man having, against his wife's wishes, married again, she, in retaliation, destroyed his plantation, and bloodshed would probably have been the consequence had not the natives, armed with clubs and spears, prevented it. On that occasion the women, also armed with impromptu logs of wood and stout poles, took a leading part; their shrill voices being heard above the excited tones of the men. Few men over twenty years of age remain single, and both sexes are nearly equally represented, though, as a rule, their progeny is not

numerous. Some of the younger women are remarkably pretty; but after matrimony they soon lose their beauty, and when old their features become wizened and unattractive. The men carry their age better, but the oldest would scarcely exceed sixty years. The following articles, or some equivalent for any among them that he does not possess, are necessary to induce a father to part with his daughter in matrimony to the donor: 1 dog's-teeth necklace, or *dodom*; 1 pearl shell, or *mairi*; 1 pig, or *buruma*; 1 nassa-shell necklace, or *tautau* (6 folds); 1 stone tomakawk, or *ila*; 1 white cone-shell armlet, or *toia*; 1 spear, or *io*; and 2 women's girdles, or *ramis*, made from the sago-palm, and coloured.

Native Money.—This is represented by articles of barter, which differ in value among the various tribes, depending upon their appreciation of, or requirements for, such commodities. Small red beads, however, are universally prized; while the value of blue and white ones is poorly estimated by them in comparison. The former of these, and tobacco, constitute the most convenient trade for general purposes among the Motu, Koiari, Koitapu, and Ilema. The Koiari grow their own; but the strong European tobacco is much preferred by them, nevertheless. The Maiva were no smokers until within a few months ago, although situated between two peoples who indulge in that habit to a considerable extent; while the Kirapuno use it in a less degree than the Motu. Pearl-shells are held in high estimation by the coast-tribes, who work them into chest-ornaments, but the mountaineers have no use for them. Those to the north are particularly fond of this article, and will sometimes give a canoe in exchange. Hatchets, knives, and looking-glasses are sought after by all; fish-hooks are used only by the Roro (Yule Island), and a few Maiva natives; while Turkey-red and matches are highly valued by the latter people, as well as by the mountaineers. Necklaces, or *dodoms*, made from the eye-teeth of dogs, are so prized by the Motus, that offers of several pearl-shells for one were always refused; these teeth would no doubt be good trade. Salt is an almost indispensable present to take when travelling inland, being considered by the Koiari as one of their greatest luxuries; so that those who come to meet the trading-canoes, or *lakatois*, often return with several bamboos full of sea-water.

Weapons.—While the bow and arrow is the war-weapon of the Papuan and Kulkuliga, the spear, or *io*, is almost wholly employed by the Papua-Malay, both in war and in the chase. Bows and arrows brought from Ilema are nevertheless sometimes found in their houses. The spear used is made of coconut wood, 9 feet long, and usually barbed near the point, the

thickest part being at the centre of gravity. They are not poisoned like the war-arrows of the darker race, who steep them into the putrid carcass of a victim, and the workmanship is very inferior. The Koiari, however, show considerable skill in their manufacture. The Motu use a shield, or *kesi*, made of flat wood, partially covered with wicker-work, 2 feet 6 inches long, with circular top and bottom, and having the sides concave. On the inner side is a handle, by which it is held in the left hand, while the spear is thrown with the right. The shield, or *rana*, of the Ilema is of the same length, the wood being shaped like the section of an egg, and ornamented with red, white, and black devices. Owing to the different sort of weapon used by that tribe, a niche is cut in the top to allow the left arm to pass over it for holding the bow, while a sling to sustain it is passed round the shoulder. Stone clubs, or *gahi*, and tomahawks, or *ila*, are universal. They are made from green stone found in the interior. The clubs of the Koiari are sometimes star-shaped, much time and patience evidently being bestowed upon them. The more common ones in use are hammered and ground into the shape of a flat round plate, 6 inches diameter, sharpened at the periphery, and generally bedecked with feathers. Those of the Ilema form a solid oval ball, roughened on the surface. Wooden clubs and bone daggers, from the cassowary, complete the chief weapons used by the various tribes I have mentioned.

Dress and Ornaments.—The men's ordinary dress consists of a plain band, or *tsi*, of tappa-cloth, 1 inch wide, strapped tightly round the waist, one end of which is then passed down the back beneath the body, and fastened up in front. This applies to all the tribes except the Kirapuno, who usually wear stained yellow belts, ornamented with black devices, allowing the ends thereof to hang down. On special occasions a stiff bark-belt, or *kava*, nearly 3 inches wide, is worn over this, laced up injuriously tight.* Armlets woven from the fibre of the pandanus-leaf are similarly worn, literally bruising the flesh beneath. A necklace of nassa-shells ground down and strung together is commonly worn. Before dances they paint the face with streaks by means of a rose-coloured lime, or any gorgeous colour they can obtain for that purpose. This lime is found on the mainland opposite Roro (Yule Island), and is eaten in small quantities with the betel-nut. They likewise wear head-dresses of bird-of-paradise (*Paradisea raggiana*) feathers, and those of other gay birds, while the variegated leaves of the croton, sweet-smelling herbs, and

* I have known a boy's waist contracted by this means to a girth of only 1 ft. 9 in., while his flesh, 2 inches above and below, bulged out to 2 ft. 4 in.

the single hibiscus, are frequently placed behind the armlets or upon the head. Ornaments from the shell, *Tridacna gigas*, ground off by constant friction with a piece of flint, resembling a pair of horns, are worn, passed through the septum of the nose. White shell-armlets from the species *Turbinidæ* are much valued. The ears are pierced, and among the northern tribes the lobe is artificially elongated, carrying leaf ear-tubes 1½ inch diameter. The Koitapu men can be easily distinguished by wearing a headcloth, or *veribota*, which covers the back part of the hair, being bound round by a headlace, or *remika*, of kangaroo-teeth. The Koiari wear similar clothes, but they are much less common among them. A small bag of fine network is usually worn by the Koiari, containing their lime, *udi*, betel, *fara*, a pungent leaf, *kari*, and a long berry slightly rough on the exterior, called *uroto*, possessing a peculiarly spicy and aromatic flavour. Ripe chilies, or *muara*, of remarkably fine growth, are also made up into head-ornaments by that mountain-people.

The women's ordinary dress consists of a fringe girdle, or *rami*, 15 inches deep, made from the pandanus-leaf, completely encircling the loins. The same sort of dress is, I believe, found common in all parts of New Guinea, but a superior one is also characteristic of the Peninsula. These are principally made at Kapatsi (near Manumanu), from the sago-palm leaf, which is torn into fine shreds, formed into small bunches, and then doubled over into tassels, each one being tied round near the bend. They are afterwards dyed yellow, and also of a brownish-red, when a hundred are threaded compactly upon a string, and the fringe cut to a becoming length. Excepting the head-dresses, their remaining ornaments resemble those worn by the men, but the ears and neck are more profusely decorated. With certain trifling variations, the coast women dress much alike, but those of the interior have fewer ornamentations, and some of them, I remarked, wore netted vests. The difference in climate is no doubt found to necessitate this addition to their attire.

Tattooing is common in the Peninsula, especially among the women. The body, legs, and arms, are usually decorated with black devices in great profusion, and the face less so, and the character of such ornamentations usually changes with each tribe. The flesh is first painted, and then pricked over with a sago-palm thorn, as the sufferer lies upon a board placed on the beach. The character in vogue among the Motu has not a dissimilar appearance to the inscriptions of the Egyptians. The bodies of the men are often untattooed; but an heroic deed entitles a man to the distinguished privilege of striping his

forehead; though being, as a rule, neither a courageous nor warlike people, these honourable badges are few.

Amusements.—Excepting while the Motu canoes are absent on their trading-voyages, dances, or *mavarus*, are almost of nightly occurrence among the unmarried of both sexes. They take place on the beach in front of the chief's house, commencing at dusk and sometimes continuing until dawn, more particularly so during the few nights following the safe return of their friends and relations. Moonlight nights are preferred, as no fire or other artificial light is burnt at such times. The dances vary in character, but all are conducted with order and propriety. On great occasions the children seat themselves around a cleared space, while the grown-up men and women stand behind to witness the performance; and the chief with some of his friends look on from the verandah of his house. Each man carries a drum; all accompany the sound by a monotonous chant, keeping wonderful time with their bodies as they go through a series of figures like those of a quadrille. Etiquette forbids the married people from taking part in these recreations. None of the Kirapuno women are, however, allowed to dance; but the dances of the married and single men are charmingly graceful and pleasing. Each carries a drum, which he sways from side to side, or above the head, accompanying it by the voice and the movement of the limbs, the evolutions employed resembling those of a ballet. The Motu are very fond of singing, and when in their canoes, their voices, mellowed by distance, may be frequently heard.

On the completion of their trading, canoe-regattas are held. The canoes, or *lakatois*, are usually made of three large canoes bound firmly together, side-by side, each fitted with square sails set between two masts, or an elliptical one. In order to correctly test the sailing powers of each, a circle of half-a-mile radius is indicated. During these trials there is much merry-making, and the winner receives the congratulations of the less fortunate. While the *lakatois* are away, the children make models and hold liliputian regattas among themselves. A custom, universally respected, prohibits a man from entering a house of a woman whose husband is absent; hence, of whatever colour she may be, she feels perfectly secure. A few of the children have small bows and arrows to amuse them; others, whips, which they are very fond of cracking; and the babies are given a few sea-shells to play with. The latter are carried on the arm or in net-bags, *kiapas*, which at other times are often suspended with the contents to a beam beneath the verandah and rocked to and fro. All these tribes are fond of public speaking, which commences after sundown and lasts far into the night; but the

women do not, as a rule, take any part, unless the point at issue is one of urgency or unusual interest.

Zoology, &c.—The only mammals found in the Eastern Peninsula are—a species of kangaroo, considerably smaller than that of Australia, and exceedingly plentiful; the pig, which is frequently kept in a domesticated state by the natives, and, when wild, usually inhabits the river-banks; the dog, resembling the Australian dingo in its peculiar yelp, found in every village; the flying squirrel, bandicoot, rat, opossum, and cuscus. The opossum is very rare in the neighbourhood of Anuapata, if not in the whole Peninsula, but I procured one male specimen. The cuscus is found at Ilema, and further north, in considerable quantities. Reptiles become more numerous as the low land to the west of the Gulf is approached, only one being seen during our travels inland. Insects and land-shells are plentiful in the neighbourhood of Roro (Yule Island), but the latter scarcely exist in the vicinity of Anuapata, and the former are scarce. Birds are numerous; and I obtained, through my collectors, about 150 different species, some of which, it is believed, are quite new. These, with some marsupials and other interesting specimens of natural history, as well as curiosities, will, I am led to believe, not be without some scientific value, although their collection was quite of secondary consideration, and will assist in enlarging my private museum in Leicester.

Flowers are very scarce; but orchids, lilies, jasmine, hibiscus, and a few flowering trees, are found here and there; but, for want of carrying power, I was unfortunately prevented from obtaining specimens.

Colonisation.—Having given a few leading characteristics concerning the Eastern Peninsula of New Guinea, and those of its people with whom I came in contact during a three months' residence in that country, I would take the liberty to conclude by a few words respecting its colonisation.

The climate of a country proposed to be annexed may exercise an important influence in guiding any decision respecting it. I have already given certain statistics which are not encouraging, but the deaths alluded to, it will be noticed, are confined to the coloured natives of Polynesia. They having resided longer in the Peninsula than any white man, such a result would be natural, but the percentage is enormous. I am inclined to think, nevertheless, that Europeans can withstand the fatal effects of tropical illnesses caused by change of location better than most dark races, and that, consequently, in localities where the latter die the former might only have a passing illness. But although the climate of its coast cannot

be called healthy, that of the mountain-tops further inland would, I feel convinced, be found otherwise, and it is there principally where the labours of the cultivator would be best repaid. But even along the sea-coast I do not think that much need be feared so long as proper precautions are taken in the manner alluded to elsewhere. The west of the Gulf is decidedly unhealthy, though high and healthy localities may perhaps be found 200 or 300 miles in the interior, by means of the Fly River, and due north of the Gulf at a considerably less distance, but these remain to be proved.

So far as trading is concerned, it is certain that the natives have at present no article the export of which would offer sufficient inducements to tempt any Colonising Company to settle on the Peninsula with a pecuniary motive in view. Tortoiseshell does exist, but I should doubt if there was so much as half-a-ton weight in the entire area. Precious minerals may, and probably do exist among the high mountains to the north; but gold is quite unknown to the natives, and no signs of any were met with by my party. Ebony and sandal-wood likewise remain to be discovered; while some of the finest timber in the world is only waiting for hands to work it in the south of Australia. The land would have to be purchased from the natives; and any refusal to sell to such a Company would probably lead to serious consequences, and change their present feelings into those of hostility. From numerous inquiries, and my own observations, I believe that pearl-shell, if found at all to the west of the Gulf, will not be found in sufficient quantities to pay; while tripang (*bêche-de-mer*), though found on the reefs to the south, is not over-abundant.

That the inhabitants themselves are sufficiently intelligent to wish for further enlightenment I quite believe, but to effect this change too much care cannot be exercised. Any large or sudden influx, without its motive being perfectly understood, would either be resisted, or else drive the inhabitants from their own homes and plantations into the interior, only to result in their extermination, like that steadily taking place among the aborigines of Australia. Such a system as that referred to among a superior and not unfriendly race must, at all events, be avoided, for her inhabitants are already too few. Of all modes of colonisation among an untutored people, I conceive that to be the best which is attained by peaceable means; that which raises them into a sphere of contentedness and usefulness; which, while not permitting insubordination, yet exercises gentleness; which, though governing, yet allows her subjects—whether black or white—to have an interest in that government. It has been contended that the Dutch system is one of

oppression, if not of slavery; but I am unable to see that either of these exists in a government which obliges an indolent people, even though at first against their will, to become tillers of the soil, whereby they are created useful members of society, find themselves more contented, possess better homes, and *all are benefited.* Such is the case with eighteen millions of Javanese; and a system that can accomplish this end is not one to be lightly regarded.

IV.—*Extracts from a Diary of a Tour in Khorassan, and Notes on the Eastern Alburz Tract.* By Captain the Hon. G. C. NAPIER.

(Communicated by the INDIA OFFICE.)

[*Read*, January 24th, 1876.]

DIARY.—*July 3rd*, 1874. *Gulhek to Kammer*, 23 *miles*.—From Teheran or Gulhek there is, besides the route skirting the mountains usually taken by troops and caravans for Sharud and Mash-had, an alternative route running parallel to it, but considerably more to the north. This is said to be a rough and difficult road, but, maintaining as it does a much higher level, is preferable in summer.

Starting from Teheran or Gulhek, the summer-quarters of the British Legation, a village path leads across the lower undulations of the Alburz Mountains, a fertile tract known as the Shamranat. There was still snow on the mountains, and many copious streams traversed the plain. The most striking feature of this tract is the marked contrast between the land within and out of reach of water. A space of a few feet only intervenes between the most luxuriant vegetation, an undergrowth of rank grass, clover, vetches, forest trees, and trees laden with fruit, and a barren, hard, dry, soil, bearing only a scanty crop of thistles. This contrast lends to the gardens and hamlets scattered over the hill-skirts half their beauty, or rather half their charm. At a distance of about 16 miles is the hamlet of Surkh-hissar, distant from Teheran 12 miles. Thence there are two roads, one due east, crossing the Jajarud stream by a ford; the other bending north-east over the spur dividing the Shamranat from the Jajarud Valley. There is an easy ascent of 700 feet in 4½ miles, and a steep descent of 800 feet in 2 miles to the stream, which is spanned by a solid stone bridge of four arches, beyond which is a causeway of a few feet in width crossing the flood-bed. Three miles below the bridge is a shooting-

lodge of the Shah's, below that point the stream divides into numerous channels, and shortly distributes its waters into the canals of the neighbouring portion of the plain of Veramin. From the bridge the route passes east up a narrow glen to the hamlet of Kammer, the first stage. Bare brown hills of gravel and alluvium shut in the glen and hamlet with its few patches of corn. Notwithstanding an elevation of 5200 feet, the thermometer showed a temperature of 95° in the shade at midday. At night it fell to 53°.

4th. To Giliard, 23 *miles*.—Leaving Kammer the road winds east up a narrow glen which shortly widens out, showing a little cultivation and low hills on both sides. In four miles an elevation is gained beyond which extends a wide undulating plateau extending for 18 miles east, and 12 to 15 in width; bounding it on the north are the lower spurs of the Alburz, backed by the high rocky ridge seamed with snow. To the south the plateau falls away to a valley in which flows a small stream from Demavend, beyond is the long, dark barren ridge of Karagatch, of considerable height, separating the plateau from the plains and the caravan route. Two small perennial streams traverse the plateau, the first known as the Bunahind Rud, with a hamlet of that name on its banks; the second as the Rud-Hind. Both support considerable extents of cultivation and large gardens. On the Rud-Hind stream is the fine village of Siahbund, the population of which are Kurds transplanted by one of the Shahs, probably Shah Abbass the Great; there are also other scattered villages and hamlets of Kurds, who are all Crown tenants. The soil is good and light-looking alluvium mixed with gravel, with a fair covering of rough grass and wild flowers. In the more barren parts gravel predominates, and a hard, dark sandstone crops out. The wheat and barley were light and poor-looking with no straw, but the grain is said to be large and the yield an average of 25 to 30 fold. A constant supply of water, however, is required to raise even wheat and barley, and this fine tract, with a most delightful climate, and a sun not oppressively hot even at midday in July, is incapable of supporting a population. There are also no such evidences as exist in the south of Persia of the water supply and irrigated area having been in former times greater than at present. The east end of the plateau is broken by a projecting spur of the main range, from the crest of which a fine view is obtained over the wide, open valley of Demavend. The Peak of Demavend on the north towers grandly above the lower ridges, from a gap in which issues a green line of gardens; this gap spreads out to a couple of miles in width where traversed by the road, thence bending westward it contracts, and

finally disappears behind the long slopes of the plateau bounding the valley to the south. Eastwards a barren slope undulates gently to the sky-line, dotted with but a few green spots of cultivation. The large village of Demavend, lying to the north of the road, is hidden by gardens and tall groves of poplar; it has 400 to 500 houses all inhabited, for the famine was only slightly felt. The population is said to have actually increased by immigration, and this is testified by the appearance of the valley, which is fully cultivated; there is not the usual margin of land thrown out of cultivation.

5th. Saidabad, 21 *miles.*—Leaving Giliard the road runs east across the valley of Demavend, passing the little stream of that name by a good stone bridge, and thence on for 20 miles through the fertile village lands of Ain-i-Verzan, Jaghun, and Sarbundan to Saidabad, where the plateau ends abruptly. This plateau is a continuation of the Bumahind tract already described, but has greater width, a more level surface, and a better supply of water. Its soil is a fine alluvium with little sand or gravel, and of considerable fertility, producing besides heavy crops of wheat and barley, maize, pulses, castor-oil, and cotton. There are seven fine villages, the four above mentioned, and Ab-i-Sard, Mazinak, Bagh-i-Shah. One of the smallest, Ain-i-Verzan, pays 60 kharwars of grain, and 120 Tomans nominal revenue per annum; besides furnishing 50 men to the regiment of Teheran. One-half of the village is held in free grants by Syuds. This assessment, though apparently trifling, is really high in comparison with that of similar villages in other parts, and indicates a great fertility. With assistance in digging wells and water-courses, other parts of the plateau might be brought under cultivation, and would rival in production and in beauty the most favoured tracts of south-eastern Europe. With a good road over the mountains, a large population might be supported, without fear of famine, by the surplus grain produce of Mazanderan, and their more scanty lands and water be devoted to the production of cotton, tobacco, fruits, wine, and other valuable staples of foreign and internal trade.

Ain-i-Verzan, overshadowed by lofty mountain-ridges seamed with snow, with its avenues of poplars, and green fields watered by a stream dashing down to the rock-strewn hill-skirt in one white line of cascades, and neat mosque with white octagonal spire showing over the green boughs of elm and sycamore, might compare with any village in the Tyrol or the Swiss Alps. In spite of its elevation, the winter on the plateau is said to be scarcely more severe than in the lowlands; snow falling to a great depth, but melting quickly.

On the hill-side above Saidabad was the camp of a party of nomads of Turkish origin, but now Shiahs, of the sect known as the Ali Illahi. Their belief is that Ali, the nephew of the prophet, was God incarnate. They appeared to have no notion of the origin of this doctrine, and said that "everybody believed the same;" the tents, made of black goat's-hair woven in strips, were supported by a number of short sticks placed at any angle; though frail-looking, they are said to give good protection against both wind and rain: the women of the party were unveiled, and made no show of hiding their faces. They were hard at work making "kwat," a sour cheese of sheep and goats' milk churned in a leathern bag. In winter these tribes descend to the lowlands camping on the outskirts of some large village, where they barter their "kwat" for other necessaries.

6th. To Firuz Kuh, 30 miles.—Crossing the valley into which the Demavend Plateau falls with a steep scarp, the route to Firuz Kuh, the next stage, leads up a narrow gorge with rocky hills on both sides; over a green plateau for a short distance, and thence down a wild, rugged glen to the banks of the Deli Chai, a small stream flowing into the plain of Veramin. The Deli Chai, or "mad stream," flows through a picturesque valley enclosed by lofty mountains of grand outline, throwing out bold, rocky spurs of slate and sandstone. The cliffs alternate with green slopes covered with cypress and juniper. On the bank of the stream was a camp of a party of villagers from Veramin, spending the summer in the mountains, with their flocks and herds and families, while their crops were being cut by hired hands. The usual laborious process of churning kwat was going on; the men of the party seated and doing the women's work of spinning. From the Deli Chai a good path leads over a very rough tract of country for 14 miles to the Nimrud, a large stream flowing into the Veramin plain. Across the Nimrud is the plateau of Firuz Kuh, green and fertile, traversed by the Sowa Ghee, a small stream with marshy banks. The village of Firuz Kuh is situated on the south side of the plateau at a point where this stream enters a rocky gorge shut in by two opposing cliffs of limestone 300 to 400 feet in height, and surmounted with the ruins of an ancient fortress, said to have been built by Alexander the Great. The village has 500 houses, many of which were, however, emptied by the famine. At Sowa Ghee, a village six or eight miles higher up the stream, are said to be some rock inscriptions. Through Firuz Kuh lies the main post-road to Mazandaran. It is now much used by caravans taking rice, timber, and charcoal to the capital, but must shortly be superseded by

the Shah's new road further west down the valley of the Haraz.

7th. To Gur Safid, 18 *miles.*—From the east a small stream, known as the Gur Safid, flows into the Firuz Kuh Plateau and joins the Sowa Ghi, the united streams then flowing south. The route lies directly up this stream. The Firuz Plateau, thus plentifully watered, produces very large crops of grain. The whole of the north-east portion of the plain, known as the Julgah-i-Katalan is under cultivation, and there is ample room for extension. I heard the common complaint of scarcity of hands to till the soil. The lower part of the glen of the Gur Safid is a perfect gem, and it would be no easy task to find its match in any country. Fine crops of wheat in full ear extended along its whole length reaching to the foot of the hills, and covering every available foot of ground. The fields are separated only by low banks covered with blue corn-flower, larkspur, and tulips; every spare strip a parterre, with a carpet of short, close, green turf. The two villages in the glen, Shah Deh and Kamad, are buried in groves of poplar, elm, and ash. The hill-slopes are barren, but their barrenness serves but to enhance the freshness of the verdure they enclose. Opposite to the last-named village the stream makes a sharp bend to the north, passing through a narrow gorge shut in by high cliffs, on the ledges of which are a few gnarled stumps of cypress. The gorge is not more than 100 yards in length; the cliffs on either side, 300 feet in height, are formed of a light-coloured limestone, different from any of the surrounding rocks. They have the appearance of having been forced into their present position by volcanic action. Beyond the gorge, and near its mouth, are the ruins of an old fort, built entirely of red sandstone, on a low hill of the same rock. Thence the valley widens, and continues with varying width for 10 miles to Gur Safid, a grazing-ground of a nomadic tribe which winters in the plain of Lemnun. It is extensively cultivated, and affords rich pasturage. Every little glen had its camp of black tents. Both men and women were well clothed, the latter unveiled and wearing a good deal of jewellery in the shape of strings of gold coins and beads. The tents were spread with felts and home-made carpets, and appeared clean and weather-proof. Cattle, horses, and large flocks of sheep grazed on the marshy pastures and on the hill-slopes. The tribe pay no revenue, giving only a small percentage of their young men to the Shah's army.

8th. To Khing, 20½ *miles.*—From Gur Safid the route follows the valley to its head, and thence, crossing a narrow, low ridge, passes into the valley or plateau of Jash, so named from an old domed tower said to have been built by a Guebre king.

The tower is octagonal, 20 feet high, and very massive. There were no carvings or inscriptions. From the Jash Valley the road leads across a rough hilly tract of country into the basin of a small stream flowing from the east to a pass leading down to Mazandaran, known as the Anaseran Pass, and said to be very rough and difficult; following the stream to its source, a steep ascent leads on to the plateau of Khing, an elevated tract, supported by a great spur, running out from the Nezwar Peak of Alburz into the plain near Lemnan or Lemnun. Both the Jash Valley and the plateau of Anaseran are cultivated in parts, and the wheat-crops were fine; the whole area is, however, insignificant. The enclosing hills showed nothing but soft rocks, sandstone conglomerates, gravel, and shale, but in the bed of the Khing stream were many boulders and pebbles of granite, quartz, and other older formations.

The plateau of Khing is a good specimen of the summer quarters of the nomads, with an elevation of 9400 feet, and open to every breeze, it has a perfect climate. The sun's rays, even at midday in summer, were not too powerful. There is a perennial spring of good water, sufficient not only for countless flocks and herds of cattle, but also to water several miles of rich pasture winding through green uplands, which rise in easy undulations for many miles on either side.

9th. To Rudbar, 13 *miles.*—Descending from the Khing Plateau, the track, reduced to a mere foot-path, crosses the glen of Daz-garrah, which drains into plains near Damghan. The level bottom of the glen, having a length of about $1\frac{1}{2}$ mile and a breadth of half a mile, is well watered and cultivated. It ends in a narrow defile, with high precipices on either side, a perfect natural fortress.

On an overhanging spur is a picturesque Imanzadah, with a group of weather-beaten cypress. Crossing a spur the route enters the valley of Khing Khurrah, the lower portion of which is cultivated, the upper covered with fine rich pasture, on which were grazing several good brood-mares, and a herd of fine heavy short-horned black cattle, as superior to the ordinary horned beasts of the East as the rich grass, in which they stood knee-deep, is to the bare pastures of lower elevations.

Following this valley for several miles a picturesque defile is entered, the track winding down through it, overhung by high rocky spurs, well clothed with cypress and juniper; after leaving the pass, the stream turns down west towards Mazandaran, through a gap in the main range, and is joined by a tributary brook from the plateau of Rudbar, a fertile pasture of 5 or 6 miles in length, and a little less in width, enclosed by spurs of the outer chain.

12*th. To Husainabad*, 21 *miles.*—From the Rudbar Plateau the route into the valley of Fowlad Mohalla crosses a high spur of the main range, which is connected at this point with the outer range. From the crest of the spur the whole southern mass of the Alburz, clothed from summit to base with dense forest, was visible. A sea of white clouds hid the skirts of the range and the Caspian. Near the crest commenced the forest, at first a few stunted oaks, lower down masses of beech, maple, oak, and other deciduous trees, growing to a great height and girth; no conifers or evergreens were to be seen. Scattered through this forest, which extends in many places to the sea, are a few villages inhabited during the summer only by shepherds and their wives, who are employed in preparing "kwat" for winter consumption. The milk, that of sheep and goats only, is collected in large iron vessels, warmed and left to stand till thickened into a sour mass of curds, and then churned in a wooden cylinder, 8 feet high, perforated for the escape of the water. The cheese when turned out is cut up into small cubes. It has a bitter taste, which, however, it is said to lose after being kept for a month or two.

Descending from the crest of the range, the route passes into the plain of Fowlad Mohalla, in an easterly direction. The plain stretches for 35 miles, bending west at its further end, and closed by barren spurs, through which it drains into the Damghan Plain. With an eastern exposure it has also a sterile soil, impregnated for the most part with salt. The stream of water flowing through it, and the water of all the kanats, is brackish. Fowlad Mohalla is a large village of 200 houses, lying 2½ miles from the foot of the pass; it has a good stretch of cultivation, watered by a few small brooks from the glens of the main range. Four miles below the village is a fine pasture with a spring of drinkable water. From this point the soil of the centre of the valley changes from gravel to a light, porous, spongy alluvium, through which any water reaching the surface sinks so deep as to form a treacherous quicksand, dry on the surface, but unable to bear the weight of a laden mule, and girth-deep. The hills on either side of the valley reach its level in low easy spurs of white and red marls and clay, much seamed and furrowed by weather. The banks of the stream are lined with dwarf tamarisk and various species of salsola, clearly indicating the nature of the soil. Though no mines are worked, it may safely be presumed that salt exists in large quantities in the mountains, from the upper crust of which the soil of the basin has been washed. From Fowlad Mohalla to Husainabad, a spring with a small garden but no habitations, is a distance of 15 miles, without villages or cultivation, and with sweet water

in one place only. A mile from Husainabad, on a spur of red sandstone, is the village of Surkhdeh of 100 houses, at the mouth of a pass leading to Sari, the chief town of Mazandaran.

13*th*. *To Chasmeh-i-Ali*, 16½ *miles*.—From Husainabad Spring to Chasmeh-i-Ali; a distance of 16 miles, there is no village. The plain becomes, if possible, more barren than before; and the aspect of the enclosing mountains more forbidding. The soil changes from the light spongy loam of the upper part of the valley to gravel and sand, the surface strewed with boulders and large pebbles. A mile from Chasmeh-i-Ali, the barren hills close in and conceal it and the village of Astana from view. Passing between the enclosing spurs and across the salt-stream which is left flowing east, the route turns north-east towards a depression above which the tree-tops of Astana and of the holy spring shortly become visible. The spring, enclosed by a wall and shaded by a grove of fine plane and poplar trees, lies in a hollow about a mile north of the village (Astana). Below it is a pretty camping-ground, in a grove of willow, walnut, and elm trees, through which flows a stream of pure water which it feeds. The utter desolation of the valley above the green oasis watered by the stream is most striking, and fully accounts for, if it does not justify, the local belief in the miraculous origin of the spring.

14*th*. *Chasmeh-i-Ali*.—Visited the spring which had been the previous day occupied and enclosed by the camp of some ladies, the property of a Governor in Mazandaran. It is chiefly remarkable for the great volume of water that issues from one point, and the complete sterility of the valley and surrounding mountains from which it is presumably fed. The discharge at the spring-head was found to be, at a rough calculation, 100 cubic feet per second. The water is perfectly pure, having apparently no matter in suspension; but it is credited with some healing properties, and is said to be especially efficacious in all skin-diseases. Possibly the persons who resort to it would find the springs of their own villages equally so, if more freely resorted to.

The stratum from which the spring issues is a conglomerate of gravel, with some large angular boulders of limestone, possibly brought to the spot at some very remote period; no other rock is visible. A large tank, shaded by a fine plane-tree, is filled from the spring and contains a number of tench, said to be sacred, but, as I found, not difficult to land with a silver hook. A building erected by the Shah on the edge of the tank, might, if not occupied by some of the pious fraternity of tramps usually to be found hanging about such places, be available for any European traveller who chose to pay a small sum, and would be a most pleasant lodging in the summer.

Being at the junction of one of the main trade-routes from Mazandaran and Astrabad to Shahrud and Damghan, and a route much used by pilgrims bound to Mash-had, the spring is visited yearly by large numbers of travellers, who usually halt a day to bathe in the stream and pay their respects to the local idol, a mark which those who are so inclined believe is the impression of the foot of Ali; the foot-print has been very neatly carved out of a block of stone, and is protected by a wooden railing from too close an inspection.

The village of Astana, though watered only by the salt-stream, has fine gardens, trees, and corn-fields; it is beautifully situated in a green basin, shut in on three sides, by barren precipitous heights.

15*th. Sawur*, 23½ *miles*.—There being still some days to spare before the departure of the convoy to Mazenan, I determined to march with a light camp over the Shamsherbur Pass, reputed by some to be the ancient Caspiæ Pylæ, into Mazandaran, and back to Shahrood by the main road from the sea, over the Chachalyan Pass, a detour giving two additional marches, and enabling me to see the passes on the direct road from the sea to the plains of Persia.

Leaving Chasmeh-i-Ali, the route follows the windings of a green, fertile valley, with fine crops of wheat and barley, to the village of Chardeh, or the "Four Villages." The first of these, Kelatch, is prettily situated between two white chalk spurs on the south slope of the mountains. The remaining two (one situated higher, having been abandoned since the famine) lie at the extreme head of the valley, buried in dense orchards and groves of tall poplars; overhung by the two rugged peaks of the Shah Kuh Range, known as the Plash Zindan; they present the most perfect picture of a flourishing Alpine village. The three villages contain about 400 houses, and furnish a contingent of 300 men to the Damghan Regiment. There are a few mosques and a bath, and a public bakery, a great economiser of time, for each peasant is not, as in India, employed for hours in baking his own bread. Situated as the village is on one of the main trade-routes, large numbers of mules are kept, and can readily be obtained by travellers at short notice.

From Chardeh the road rises over easy slopes to a pass, known as the Sar-i-Halala, thence over wide, green plateaux, and through a short defile to the Tung-i-Shamsherbur, a curious natural passage between two perpendicular strata of limestone, as smooth as a wall, and of 20 to 30 feet in height. The softer strata between and on each side of the limestone have apparently been worn away by the action of weather. The passage is 150

yards long, with an average width of about 18 feet. A little stream and the path finds an exit through a natural gap, 14 feet wide, and nearly meeting overhead. There can be little doubt that this is the pass known as the Caspian Gates, or Caspian Straits. The defile below shortly widens out and the road improves. At the foot of the slope is the green glen of Russoo, with the orchards and poplar-groves of a once flourishing village of that name opening on to the Sawur pastures—a wide, marshy plain, enclosed by mountains clad with forests of oak and elm ("Nawand"). In every lateral glen was a straight line marking an old water-channel, and the terraced fields lay abandoned. I was informed that there were in former days 32 villages in the "Bulúk" of Sawur, which has now only seven. The cause of this depopulation, my informant could not tell me. It was, I think, on his tongue to say misgovernment,—the usual cry; but, being a "Ket khuda," or headman, and not knowing my relations with the powers, prudence dictated silence on that score. Decrease of rainfall was only half admitted. Last winter's snowfall so favourable for the crops in the low lands, was too severe to please the farmers in these higher tracts.

16th and 17th.—Halted at Sawur.

18th. To Asp Neza, 13½ *miles.*—Moved camp to Asp Neza, a pasture-ground with a little cultivation, on the banks of a stream of that name, and on the main caravan-route between the sea and Shahrud.

19th. Halt.—Ascended the peak known as Jehan Numah, or "World Shower," 8900 feet, the highest point between the ridge of Shah Kuh and Nezwar, far away to the west, the highest point of the range save Demavend. From the summit, when turned, the main chain was visible; to the west, the lofty forest-clad ridge, throwing out endless buttress-like spurs towards the coast; to the north, the coast of the Caspian and the silver line of the River Gurgan. The passes leading to Shahrud appeared like deep ditches in a level green field, so wide and flat are the plateaux above and skirting them. The mountain itself is formed entirely of sandstone and limestone, without a trace of volcanic rock. The slopes are clothed with a thick forest of oak. The branches of every tree and bush on the ridge inclined to the south, showing the direction of the prevailing wind, which, bearing with it dense clouds of vapour from the sea, keeps the northern face of the mountains bathed in moisture.

20th. To Shahrud, 19¼ *miles.*—Marched to Shahrud. From the Asp Neza the route to Shahrud, following up the course of the stream, passes into a narrow defile, known as the Tang-i-

Ludian, overhung by stupendous walls of limestone rock. The strata, everywhere violently contorted and in many parts vertical, have their exposed ridges worn into the most fantastic slopes.

Though presenting no great difficulties to the passage of guns and carts, such a defile could not be attempted by any force not strong enough to hold the hill-tops on either side. Clearing the defile the hills recede slightly, and the road continues up stream, passing occasional small patches of wheat and barley, to the foot of the Shah Kuh Range, where in a deep hollow lies the village of Shahkuhpaïn. Around the sides of the hollow are terraced wheat-fields, extending far up the mountain-slope. The village has 40 houses, and ample supplies for a small party. The village of Shahkah Bala, lying about two miles to the north on a spur, has 60 houses and a great extent of good land. It is supposed to be the highest inhabited point in Persia, and is probably 7800 to 8000 feet. Both villages lie under the shadow of the high ridge, bearing the local name of Shahkuh-Ghokshan. This ridge, rising at Chasmeh-i-Ali and attaining a height of 13,000 to 14,000 feet, runs about due east and west, and falls away into the plain of Shahrud; unlike most of the highest points of the range, it has a sharp serrated ridge, with a sheer face to the north, in the hollows of which large beds of snow lie all through the summer—an unfortunate proximity for the people of Shahkuh, who have to keep the Governor of Astrabad supplied with it at the rate of three loads per house per month; of this they complained loudly. At Shahkuh Bala there are said to be seams of coal, never worked. The lower spurs of Shah Kuh are composed almost entirely of clay, chalk, and conglomerate.

21*st*. *Tash* (*Tash*).—From Shah Kuh, descending again to the stream and following it for a few miles, the defile narrows, and is at one point enclosed by hills of pure white chalk, clay, and sand. The face of the spurs was much worn by weather and their formation exposed. The thickness, strike, and dip of successive strata down to the level of the valley might be accurately measured. These seams of coal and coal mixed with clay were visible at various elevations. One bed of blue clay, cut away by the stream, showed a seam of good coal which might be worked from the surface. The people of Shah Kuh appear not to know the use of the mineral, and had never worked it; but I found that at Tash, a few miles off (10 or 12), there was a mine which had been worked for some time, the coal being carried to Gez to supply the Russian steamers. The working of the mine had ceased with the demand, the steamer being supplied from some nearer source, or using "Baku oil"

(petroleum). Following this stream to its head, the road crosses the Chalchalyan Pass, 8600 feet, over an elevated open spur of Shah Kuh, and descends a stream known as the Gaadab above, and the Ab-i-Tash lower down, to the junction of the main road and telegraph-line to Astrabad, where is a good camping-ground half a mile from the village of Tash. The village of Tash, a mere hamlet of 40 houses, lies high up on the mountain. The people were formerly subject to constant incursions of the Turkomans; but for now thirty years have been at peace.

22nd. *To Shahrud*, 19¼ *miles*.—Marched down the defile of the Ab-i-Tash, the hills opening and getting more barren at every step. At about 5 miles the defile opens on to a wide plain enclosed by mountains utterly barren and destitute of vegetation. Traversing this plain, which is without villages and sweet water (the Ab-i-Tash being rendered brackish by a tributary from the south), the road enters the Shahrud Bostam Plain which extends eastwards to the desert, scarcely broken by the last undulations of the Alburz. There are many large villages on the plain, all walled and surrounded with watch-towers, but the state of these defences shows that the need for them has passed. It is now eleven years since a Turkoman has been seen on the plain save in the guise of a peaceful trader. Turning south from Bostam the road passes between low rocky hills to Shahrud, which lies on the hill-skirt imbedded in gardens, groves, and vineyards. The town of about 800 houses is enclosed by a weak wall, without towers or flanking defence. The heat in tents was great, but far more bearable than a similar temperature in India.

23rd. *Shahrud*.—Halted at Shahrud. [The section of the author's route from Shahrud to Mash-had, having often been described before, is omitted.]

September 26*th*.—Obtained the necessary order for guards to accompany me to Kalat, a district in the mountains north of Mash-had. The Khan of Kalat-i-nadiri is the medium of communication between the Khorassan Government and the Turkomans of Merv.

27*th*. *Kardeh*, 24 *miles*.—Left Mash-had for Kalat-i-nadiri at 11·30, and, traversing the valley of Mash-had in a northerly direction, crossed the Kashaf Rud by a good bridge known as the Pul-i-Shah. The Kashaf Rud or Abi Mash-had flows from the Chasmeh-i-Gélás, a small lake near Chenárán, and collecting the drainage of the Mash-had Valley passes out east by the gorge known as Akderband to the Pul-i-Khatum where it joins the Ab-i-Herat. Below Mash-had the water becomes brackish from the contributions of some small tributaries draining the lower spurs of the Khelatt range. The Pul-i-Shah is wide and solidly

built, and looks quite out of proportion to the insignificant stream it spans. The streams of Persia are, or have been, for the most part well bridged, but the same apparent disproportion between the water-way allowed and the size of the streams is everywhere observable. The Persians like the Spaniards (after the old "Peninsula" joke) appear to have sold their water to pay for the bridges. But in both countries the necessity for the precaution is obvious. Both are for the most part treeless, with steep slopes and a spasmodic rainfall, and are thence liable to very sudden and violent floods.

From the Kashaf Rud the ground gradually rises for 12 or 14 miles to the foot of the hills, and the route, following up a small stream, passes the valley of Rehzán and Andarukh and enters a narrow gorge known as the Darband-i-Kardeh. The gorge is shut in by a high mountain formed of immense tabular masses of metamorphic rock of a compact crystalline texture of dark-grey colour with many veins of quartz. On entering the hills the outer slopes are seen to be formed of conglomerate, weathered down to easy slopes. Under this is a stratum of slate; further on, the spurs are crowned with regular layers of stratified rock, detached masses of which cover the slopes and are piled up at their foot. These were for the most part a hard limestone formed of a mass of shells and a fossil substance apparently black coral. The shells were of various forms, but I observe no nummulites. The metamorphic rocks would appear to have been forced by some convulsion of nature through these overlying strata, and form a high outer barrier of inaccessible crags rising to a height of 1000 to 1500 feet above the hill-skirts. After clearing the gorges the track enters an open valley, at the head of which lies the small village of Kardeh. I was received and hospitably entertained by Rahím Khan of Cholie, the owner of twelve villages in this and adjoining valleys. The villages are inhabited by Kurds and Turks, formerly a wild lawless set, but now in better order. They furnish forty horsemen for the protection of the border.

28th. Kardeh, 28 miles.—Left Kardeh following the Kardeh stream through rugged tortuous defiles to a glen in which it rises among the spurs of a high rocky range, the main chain of this branch of Alburz. The peaks of this chain present a most picturesque appearance, the strata of a hard grey limestone are for the most part on edge, and rise in sharp jagged teeth to a height of 6000 or 7000 feet, or 1000 to 500 feet above the general level of the mountain. Vegetation is very scant, the only tree growing wild is a cypress or juniper (*Juniperus excelsa*) common to all parts of the Alburz that are beyond the reach of the moist breezes of the Caspian. With a stunted scanty growth this tree

has a form of colour exactly suited to the barren rocks on which it grows. The gnarled and twisted trunk and grey spreading branches clinging to the face of a spur cliff or crowning a rocky pinnacle give a finishing touch to the wild and desolate picture presented by the higher glens of Alburz, the bare dry skeleton of a mountain range. Beyond the small hamlet of Aul, 7 or 8 miles from Kardeh, on a chance block of crystalline limestone, fallen from an overhanging cliff, is an inscription in Arabic and Persian, dating from the year 916 of the Hejira and recording a victory of Mohamad Shaibani, the Usbeg conqueror of Bokhara, over the unbelievers whom we may presume to be the Persian Shiahs.

On a scarped rock closing in the valley in front are the ruins of an old fort. Following an eastern branch of the valley, in which the Kardeh stream rises, the route crosses the central ridge by an exceedingly steep and bad path, and drops at once into the glen of Wardeh which drains to the Turkoman plain. In the centre of the glen, surrounded by a few poor-looking wheat-fields, is the hamlet of twenty houses. The people are Turks, and live by grazing large flocks of sheep and goats; for their fields, produce at all times light crops, and often nothing. Shut in by high mountains except to the north-east, with an elevation of 7000 feet, and a poor stony soil, it is surprising that any population should be able to subsist, but the Kalat valleys, those on the north and higher part of the range, are said to have a population of 8000 or 10,000, and have in former times taxed the whole powers of the most powerful ruler of Khorassan to subdue them.

29*th. Kalat*, 22½ *miles*.—From Wardeh to Kalat is a distance of about 22 miles. The track, a good bridle-path, leads for some miles E.N.E. over low undulating hills of coloured clays and shales with a fair covering of herbage fit for pasture, and then descends north down a narrow glen, rugged and wild, and picturesque beyond description. On one side steep slopes of purple, green, and brilliantly red clay and marls, with high projecting buttresses of sandstone, scantily clothed with fine specimens of juniper; on the other, peaks and crags of slate and limestones, the strata inclined and sending out into the glen steep spurs, presenting often an unbroken sheet of rock for 1000 feet, with a sharp edge and distinct serrated outline. Dense thickets of the "Zerish," or barberry, with crimson leaves and berries, lined the water-course. Following the stream along a rough boulder-strewn path for 5 or 6 miles to its junction with a fine stream flowing from the west, a narrow pass, giving passage through the first rocky barrier of Kalat, is entered. In places there is scarcely room for more than one horse to pass, and the track is

carried from boulder to boulder in the bed of the stream across very frail shaky-looking temporary bridges. Clearing the pass an open, barren, and desolate-looking valley is reached, bounded on the north by the south portion of the natural bounding-wall of Kelat,—a ridge of rock, running nearly east and west in a straight line with unbroken level summit, below which for about 300 feet is a natural scarp of dark-brown rock, falling away to the level of the valley in steep slopes and spurs of sandstones and coloured marls: only one gap was visible in the whole line, and this, though apparently inaccessible, had been carefully closed up with a stone wall. Skirting the line of the natural glacis of this fortification for 4 or 5 miles, the road leads into a narrow defile known as the Darband-i-Arghunshah, by which the stream gains access through the rocky barrier to the plateau of Kalat. In the centre and narrowest part of the defile a new gateway was being built, in apparently purposeless imitation of Nadir's gates which have been swept away by successive floods. Nadir's intention in closing up the gaps in the rocky barrier of Kelat was clearly to make it a stronghold for his descendants, who might, with this safe retreat and the wealth of plundered Delhi at command, have at least a fair start in the scramble for power in Khorassan and Persia, that he well knew would ensue on his death.

Passing through the gateway, I found a guard of Persian Sirbaz drawn up. They were, if possible, more ragged than their comrades at Mash-had, having been without relief and without pay or clothing for six months. The men looked sickly and worn out; they have heavy duty, and the water of the stream is said to be unwholesome. I noticed that, in spite of a swift current, the gravel bed was covered with a coating of green weed, by which the water was slightly coloured; possibly it may derive from this some injurious qualities. The remains of a covered water-course constructed by Nadir are still visible outside the Arghunshah gate. It carried the water of a spring, 5 or 6 miles distant, into the village Arghunshah. Like all other of his works, of which traces remain on the plateau, it was built solidly and well, and meant to last. From the gateway the road led under the walls of a small round fort, showing a couple of guns, through the village of Arghunshah and down a green fertile valley with a good stretch of rice-cultivation, to the Khan's house in the village of Gio Gunbaz. An old red sandstone tower, fluted with half-columns of the same stone, and handsomely decorated with carvings in blind arches, well executed, built by Nadir for his descendants, has been repaired by the Khan, and contains his family.

30*th. Kalat.*—The Chief of Kalat came in to-day from the

Atak, where he had been detained by a slight brush with some Turkomans from whom his men had taken two prisoners; one of these was a Kalat man, who had deserted to the enemy and served them as a guide. His fate was sealed. The Chief is a fine-looking old man, quite above the average of his countrymen, intelligent, and with a rare thirst for knowledge. He has taught himself to read English, French, and Russian, and is exceedingly well informed in geography and the history of his own and the neighbouring countries, and well up in contemporary events in India, Afghanistan, and Khiva.

October 2nd. Kalat.—Rode up the hills to the north-west of Gio Gunbaz to see the ruins of Nadir's palace, and a fine view, said to be commanded by a high point of the barrier. A narrow path ascending 1200 feet, winding up and round steep spurs composed at base of red sandstone, then to the summit of limestone, the lower strata hard, and showing only minute particles of shells, the upper 100 feet soft, and composed almost entirely of fossils, "gryphœa," with which the surface was strewn, led on to an open cultivated plateau, on which stood the Imarat-i-Nadiri, Nadir's palace or house; for the ruins looked more like those of a section of a suburban village than of an Eastern monarch's palace. The site was well chosen, and commanded a fine view over hill and plain. The whole extent of the natural barrier and enclosure of Kalat, with its plateau, mountains, and deep precipitous gorges, was visible, while to the north the maze-like ramifications of the lower spurs of the chain fall away into the Atak and the vast desert of the Turkomans, which extends in an unbroken expanse to the horizon. The ruins themselves are singularly uninteresting; they consist of a line of rectangular enclosures, the largest of which, known as the Diwan Khana, is about 60 feet square. The outer walls of stone and lime, the inner of brick. There being no springs on the plateau, and it being impossible to get a supply by wells, a line of domed* had been constructed in the glen leading down from a hill on the west side of the barrier, and the water carried by a covered aqueduct across the undulating plateau for about a mile to the buildings. Only one village, which has literally risen on the ruins of the palace, stands on the plateau. They have wells, which are slightly brackish, and reservoirs. The cultivation is entirely dependent on rain, but a good crop is generally obtained.

4th.—Received visits from Baba Sirdar, a Tekkeh Turkoman of Merv, a man of some influence, and the Khan. There has evidently been a great change in the habits and mode of life of

* *Sic* in original.

the Mervces at least. Large gardens have been planted, the young trees being brought from Bokhara across the steppes in winter, the only season it was found they could be kept alive. In two or three years the trees bear abundantly. The wealthier men have houses and also the strangers, a few merchants from Bokhara, a few from Mash-had, and some others. Wine, formerly unknown to the Turkomans, has been introduced, but appears to be sparingly and moderately used. A large quantity of brandy captured from a caravan was at once condemned by the "Istians" (priests), and the casks emptied on the sand. The distance by which the Merv settlements are separated from their nearest neighbours contributes largely to this work of civilisation, if the change from a nomadic life to a settled one may be so termed, for it ensures the isolation produced by recent events. The submission of Khiva and Bokhara has severed the ties which bound them to the Usbeg dynasties, while immense waterless deserts stretch between them and the Yomuts and Chandors. They are thus, as it were, driven back on themselves and shut in by the desert on a fertile oasis, which they have not much temptation to leave. Fear of Russia restricts their wandering far for plunder in the direction of the Oxus, while the necessity of conciliating the ruler of Herat has restricted their operations in that direction. The Persian border has been and is still an open field to the Turkoman raids, and their predatory instincts are thus, to a certain extent, encouraged and kept alive, but the influence of Persia has been, nevertheless, not altogether unsalutary. It is by her that the Turkomans have first been induced to settle at all and to attach themselves to the land. It has always been the policy of the best of the rulers of Khorassan (the Asaf-Dowlah and the Hissam-i-Sultanah have done more than others) to encourage any such inclination, by granting lands and conciliating the Chiefs with presents; though none of the settlements planted at various times in the Atak and the Sarakhs Plain have been maintained long, there can be no doubt their good influence is not lost, and that the present changes taking place at Merv may be directly traced to the example thus set, the new aspirations aroused, and the new wants created. I gathered also from my visitors that there was an improvement in the moral tone of public opinion in the "obahs." Robbery and murder are not altogether so respectable occupations as they were; the principal men of the tribes never or rarely join a plundering expedition pure and simple. Against an enemy they, of course, all combine; but it is now admitted, as it never was before, that plunder is contrary to their religion and to morality. There are fourteen or fifteen leaders (duzabashis), men of no influence,

who are professional robbers, have each distinct beats, and are joined in their expeditions by the idlers of the tribe. If these men were taken in hand and employed, the whole tribe would settle down to peaceful pursuits.

6th. To Wardeh.—Marched to Wardeh by the route already described.

7th.—Halted at Wardeh and ascended the Karadagh Mountain, the last high peak of the great eastern branch of Alburz. The summit of the peak has an elevation of 7870 feet, and commands a fine view of the plain of Sejend, and of the eastern ramifications of the chain as far nearly as the Herat River on the one hand, and of Mash-had on the other. Snow lately fallen was lying on the mountains and on all the highest points of the range. The Atak and the desert were spread out like a map 7000 feet below. Each bend of the numerous small streams flowing into the Atak, and the belts of cultivation following their courses for many miles through the sandy plains, were visible, and told a tale of increased security from hostile visitations.

8th, 9th, and 10th.—Returned to Mash-had by a route already described.

16th and 17th.—Applied to the Governor for an order to the Chief of Bujnurd, directing him to give me a sufficient guard to enable me to reach Astrabad by the shortest route, viz., across the Gurgan Plain, and, as I had anticipated, found all kinds of objections and difficulties raised. An order directing the Chief to give me a guard by that route, if it were safe, was offered, but was obviously of no use. As a reference to Teheran would have involved a delay of twenty or twenty-five days, and I was not sure to what extent Mr. Thomson would be prepared to support me in requiring safe conduct by that route, I decided that it would be inadvisable to wait, and determined to go to Bujnurd and trust to obtaining a guard from the "Eelkhance" if possible.

21st. Mash-had to Kazimabad, 12 miles.—Marched at 4 P.M. for Kazimabad; leaving the Balakhyaban Gate north-west at 5 miles, passed the caravanserai and fort of Bahrabad. The heavy rain of the last two days had done little to injure the road. The country also showed little water, and where it was much intersected by kanats the surface was absolutely dry. The most strking feature of a Persian landscape, the contrast between the verdure and fertility of the cultivated ground, and the extreme barrenness of the untilled ground around the cultivation is, to a great extent, though the cause is not at a distance apparent, due to these "kanats" which thoroughly desiccate all the ground along their courses, and, converging

towards the village area, deliver the accumulated moisture of the surrounding tracts into one central oasis, a magic circle of fertility. The courses of thirty or forty kanats, marked by little mounds formed of earth from the wells and gallery, may be seen radiating from the lands of one village, and each of these will give an average minimum discharge of 120 cubic feet of water (at a rough calculation) per minute. Their cost, allowing an average length of 2½ miles, and taking the usual calculation of 10 tomans or rupees 40, as the cost of one well, and length of shaft of 10 feet depth and 60 feet length respectively, will amount to 2000 rupees. This is, however, only the first cost. The care and labour required to keep in working order such a length of tunnel running through a light porous soil may be easily imagined. It is often necessary to support the tunnel, this being effected very ingeniously by short lengths of earthenware-pipe shaped in the most approved fashion. The mouths of the wells are also often lined and covered. I had the opportunity *en route* of watching the process of clearing some of these watercourses, this being always done carefully after heavy rain. One slip and obstruction of the waterway often, I was told, causing the abandonment of a whole line of kanat, the water rising behind the slip bursting the shaft and destroying the wells.

Kazimabad is a small village of now fifteen houses; before the famine it numbered thirty-five, and before the siege of Mash-had it was a considerable place.

22*nd*. *Kazimabad to Gunabad*, 14 *miles*.—Marched to Gunabad, visiting *en route* the ruins of Tús. From Kazimabad the ruins lie 4 or 4½ miles due north. The road or track crossed an undulating cultivated tract, sloping gently down to the Kashif road, while it passes by a good stone bridge of the usual saddle-backed construction. Embankment and abutment are saved at the expense of convenience, and two steep ramps, paved with round boulders, form a serious impediment to traffic, especially in wet weather.

There is little of interest either in the ruins or history of the city of Tús. The first view of the ruins from the rising ground south of the stream was striking, but the effect was due chiefly to landscape and sky. A long sweep of barren, yellow upland, rising from the stream, stretched away for many miles, and met the dark, lowering clouds, that entirely hid the northern mountain chain from sight. In the foreground the stream rolled, swollen and turbid, under the quaint, high-backed bridge, while the long line of wall, and the rampart of the old fort, or "ark," and the great central building, the Nakara Khan, or watch-tower, stood out in strong relief against a dark back-

ground of saturated "plough." Under other conditions of weather, the first impulse would have been to turn away disappointed; but there was an attraction in the harmony of the desolation above and around. The ruins are those of a city built very shortly after the Arab conquest of Khorassan. They answer exactly to the descriptions of the ruined cities of Seistan, with the same arched roofs, the same bricks, the same high ramparts and deep ditches.

There is nothing indicating an origin prior to Mahomedanism, though the Sassanian coins offered for sale in Mash-had are said to be found here.

I was fortunate enough to hear on the spot the correct legend regarding the desertion of Tús, though several times devastated by the hordes of Turan. Tús was still a fine city when the Caliph Mamún himself struck a death-blow to its existence. The hapless Imam Reza, poisoned by his order, was buried in a humble grave near the villages of Nowghan and Sunnabad, 12 miles south of the city; his body was thrown into a "sardah," or reservoir, which was built up, leaving a small arched room as a shelter for passing travellers. For many years the grave remained unnoticed and uncared for, and might have so remained to this day but for an accident, in which my informant plainly saw the finger of Providence. A deer, hunted by a party of Turkomans, took refuge in the archway, and was plied by them with arrows till their whole stock was exhausted; but, strange to relate, remained unhurt, while the arrows sank deep into the solid stonework, a visible evidence of the miracle that had been wrought. The story was noised abroad, and the grave visited by many people from all parts of Khorassan. The Governor of Tús ordered his own remains to be buried there and a tomb to be built. From that day the village of Sunnabad increased, the inhabitants of Tús moving over to the new settlement, probably finding that it was better to remove at once to the spot that fashion required they should be buried in.

An inspection of the site of Tús shows very plainly, firstly, that it was of comparatively very small extent; secondly, that it was built to order, and was not a chance accumulation of population; the lines of the old walls marking a nearly perfect rectangular figure, with a length of 2 miles (roughly) and width of one. In the exact centre is a large and even imposing looking mass of ruins, known as the "Nakarakhana," or alarm-house, consisting of a central dome of not less than 80 feet in length, with arched wings or porticoes projecting on the four sides. The form of the arches and masonry are distinctly Arab, and, though not quite of the usual construction, it is likely that the building was a mosque. The name "Nakarakhana" has pro-

bably been given by the later Turk population of the valley, for the "Nakara," the great battle-drum, was a purely Tartar institution.

The ark has a wide, deep ditch and rampart, 60 or 70 feet high. In the interior is a high keep, surrounded also with a ditch, and giving a good command even over the high rampart; the outer line forming a square of about 300 yards a-side. At the south and north angles of the city walls are remains of detached forts, a sort of flanking defence, and the line of *débris* marking the site of buildings radiating in tolerably regular line from the central building. No coins or other relics were to be found, and the villagers of the two hamlets occupying east and west angles of the ruins, Islameya and Shahr-i-Tús, could only point to a low mound as the grave of Ferdusi, while of the Khalif Harun-ur-Rashid they know nothing.

A ride of 15 miles from Tús, over a rather heavy country, brought us to Gunabad, a large village of a hundred houses; one-half the property of the shrine at Mash-had, the other half held rent-free by the villagers, who are of Persian origin.

23rd. Gunabad to Chinaran, 12 *miles.*—Between Gunabad and Chinaran there is a great change in the aspect of the valley; the villages are smaller and less numerous, and for the most part without gardens; but fine sweeps of pasture-land, sloping north to the centre of the valley, and watered by numerous springs, replace the barren wastes that give such an aspect of desolation to the uncultivated, that is, the greater part of the lower valley. The difference must be mainly due to the decrease in number of kanats, which are few and far between, but also to the proximity and greater height of the enclosing mountains. About midday the sky cleared for the first time, and disclosed the snow-covered summits of the mountains, now near at hand, for the valley contracts to 12 or 14 miles in width. The road is sound and good, traversible for wheeled conveyance all along. The soil is chiefly a light alluvium, much mixed with gravel, and in places with kunker (nodulated limestone), of which there must be large deposits in parts of the valley from Mash-had to Chinaran.

From Gunabad, north-east 4 to 5 miles, is the Chasmeh Gilas, a large spring issuing from the foot of a detached spur of the northern chain, known as the Kuh-i-Radkan, and said to be the source of the water that flows into Mash-had, and is used in the service of the shrine. The stream from the spring is, however, joined by a larger stream, fed by numerous springs rising from the pasture about Chinaran; a mile below the village of Amirabad, the whole water is drawn off into a canal, which reaches Mash-had divested of all the purity of its original source.

Its virtue must, therefore, be solely in imagination. The spring and some beautiful pasture, with a short, close turf, stretching for a mile on each side of the stream, are the property of the Hazrat (or shrine). The size of the basin, which has been called by former travellers—probably from hearsay—a lake, is disappointing; but there is no question of the purity of the water: at a depth of 12 or 14 feet every stone at the bottom is visible. The discharge of the spring, though only about half that of Chasmeh-i-Ali of Shahrud, is still remarkable; and the more so, that the strata, a dark-blue limestone above and a purple laminated sandstone below the level of the source, are inclined, the cliff being north and in the contrary direction to the flow of the spring. On the other side of the ridge, which has a height of from 300 to 800 feet, is a broad, uncultivated valley, sloping to the centre, and draining south into the Kashaf, with numerous springs at about the level of that on the opposite sides. The actual source of supply must therefore lie high up in the mountains to the north, and at least 15 to 20 miles distant. The little village of Sar-i-Chasmeh, adjoining the basin, has a great breadth of unirrigated corn-land, which, the people told me, always yields a crop. In good years the return is from ten to twenty-five fold, and the grain large and good. The mixture of disintegrated sandstone rock is sufficient to give its colour to the soil; and the same rock is conspicuous at the base of the mountain for many miles, with the same condition of soil. It is probable, therefore, that the sandstone, though distinctly granular, is impermeable, and retains the natural moisture near the surface. On the light-coloured alluvium in the centre of the valley nothing will grow without rain. Chinaran is a desolate-looking village of now forty or fifty families, and about 1000 souls, for there are many families of men who died during the famine, and it is the custom to reckon these as one family with the head of the house. An instance was given of four families thus clubbed. In the good old times there were vast gardens and groves of chinars, of which it is said six only remain.

I received a visit from the Khan, a feeble old man, full of the departed glories of his house. Even till recently the Khan had considerable possessions; but constant quarrels with his brother so weakened his influence that his neighbours were able to deprive him of them piecemeal.

The family is of the Zafaranlu tribe of Kurds, settled in the country by Shah Abbass the Great. After the expulsion of the Kurds from the Atak, the Chinaran section of the tribe settled in the upper portion of the Mash-had Valley, and founded Chinaran. They played a subordinate part in the history of the border till the time of Mauresh Khan. This Chief raised

himself from the position of a petty feudal baron to the Government of Khorassan, and even at independence. With a weaker sovereign than Fateh Ali Shah, it is probable that he would have succeeded in separating Khorassan for a time from Persia. For forty years he was a very unsubmissive vassal. The possessions of the tribe then extended up the valley as far as Koochan and down to Gunabad, 20 miles from Mash-had.

24th. To Radkan, 14 *miles.*—Before leaving Chinaran I rode round the walls, which were in as ruinous a state as the interior. A high, thin mud wall, with occasional towers, was, even in former times, the only defence of the town, saving always the brave Kurds, who must in truth have formed the ramparts that baffled the Afghans under Ahmed Shah, and withstood the attacks of the army of Futh Ali Shah for four months, enabling their Chief, Mamesh Khan, in the end to obtain good terms.

The road to Radkan lies about north from Chinaran for some miles across a cultivated plain, with a few villages scattered over it, and, clearing these, over fine open pasture-land. Two miles from the villages is a large tower of solid masonry, known as the Med-i-Radkan. A similar tower, with the same name, stands near the village of Radkan, on the road from Shahrud to Gez, on the Bay of Astrabad. It may be fairly presumed that the towers have given their names to the villages, and that some clue to their history may be traced in the name. Radkan appears to be neither Turkish nor modern Persian; it is probably some obsolete word, indicating the purpose of the buildings. The Cufic inscription under the conical roof of the tower is much defaced, especially on the north side, where it must be illegible.

Radkan is a large village of 500 houses, of the Zafaranlu tribe of Kurds. The Khan, the head of the tribe, lives in Mash-had; but had not called upon me. Attached to the "beluk," or State, are ten or twelve small villages, also of Zafaranlu. They have fine pastures and ample water. It was difficult to arrive at any estimate of their numbers; but, including nomads, it may amount to 1500 families, giving a population of 7000 to 8000: these include 300 or 400 tents of nomads. From Radkan a road goes to Darehgaz and the Atak, said to be the only one practicable for guns. I had proposed taking that route; but found it advisable to change my plans. Having heard that the Khan of the Bujnurd had been summoned to Mash-had, and foreseeing difficulty in getting to Astrabad by the Atrak or Gurgan in his absence, I determined to march direct to Koochan, and there ascertain the Khan's movements, visiting Darehgaz if possible. After leaving Chinaran, I rode across

the plain south-west to visit the old fort of Amirabad. The fort lies in an open plain, with a fair command of the ground around. It is, for a Persian work, well-planned, and much labour has been expended on it. The ditch is deep and wide, and well defended by a short bastion at each angle and in each face, and the ramparts thick, high, and revetted, where necessary, with sun-dried bricks. The end of the ramparts forms a rectangular figure, with two long sides and two short, of 400 and 200 paces respectively. In the interior are numerous buildings, still habitable, arranged with much regularity; the remains of casements or vaults for protection against vertical fire are visible. Abbass Mirza, in the summer of 1832, took Amirabad, after a siege of six weeks, the loss of which (considered by the Kurds an impregnable fort) broke the spirit of their Chief, Reza Cooli Khan; and he shortly afterwards surrendered Koochan, gave up his guns, and dismantled his fortifications.

From Amirabad a long ride of 10 or 12 miles, along a stony, monotonous hill-skirt, opened out the glen of Akhlumad, up which a path leads to a village of that name. A fine masonry dam, 250 paces in length, 23 in width at top, and 50 feet in height, closes the mouth of the glen, and retains the water of a small stream from the mountains. Four wells of solid masonry, built with the stonework of the dam, provide for the escape of flood-water through tunnels at the base. Four miles above the dam, through a magnificent mountain gorge, lies the village of Akhlumad, situated most picturesquely on the spurs of the mountains enclosing the glen. A circle of high cliffs enclose a basin, in which lies the village and a great extent of terraced vineyard and gardens; a crag within the basin is crowned by a ruined fort, built by Mamesh Khan of Chinaran. The cornlands lie above the cliffs and out of sight of the village. I found here a son of Yar Mahomed Khan of Herat, a pensioner of the Persian Government, who had an assignment on the village; he is too young to have any recollection or knowledge, save by hearsay, of his father's history and importance, and has to all appearance settled down contentedly on the pittance doled out to him, devoid of pride as of ambition. From the old Ketkhuda I learnt that the dam below the village was the work of Bai Sunjur, son of Shah Timur, and was no longer used, the villages in the plain formerly watered by it having been destroyed in the famine. The presence of the young Afghan he strongly objected to, for he took, besides his assignment, a great deal that the Shah could not give him. The practice of quartering idle pensioners on a peaceful village must be bad for both parties.

From Akhlumad to Radkan, which lies on the opposite or north side of the plain, is a distance of 15 miles.

25th. To Jafirabad, 27 *miles.*—Between Radkan and Jafirabad is a dry, barren tract, lying between the head springs of the Kashaf Rud, or Ali Mashad, and the Koochan tributary of the Atrak. Midway on the march is a stream of water from a "karez," quite brackish. The soil is sandy and unfertile, growing nothing but salt-plants, thorns, and a few scattered bushes of tamarisk. The width of the plain is from 15 to 18 miles. It slopes gently up to the hills on either side, and to within 2 or 3 miles of Jafirabad, where it is broken by undulations and low ridges thrown out by the mountains on the north. In winter, snow lies very deep, and the plain is swept by a cold wind from the steppes, known as the "ayesh." Jafirabad is a small village of thirty houses of Zafaranlu, Kurds, and Turks, the first in the State of Koochan. The dryness of the climate, and the high winds prevalent in the winter and spring, which destroy all vegetation not protected by a covering of snow, leave the villagers dependent on their wheat-crops. There are no gardens and no trees. In the famine years the wheat failed, and the village was almost destroyed of families, only thirty remaining.

26th. To Koochan, 18 *miles.*—From Jafirabad the country slopes gently away north and west to the Koochan Stream, which rises in the mountains to the north and flows west to the Koochan Plain past Shirwan and thence passes into a narrow defile enclosed by high mountains known as the Germekhous, in which it flows till it reaches the Gurgan Plain. With an undulating surface and fertile soil the Koochan Plain bears a very different aspect from that lying at the head of the Mash-had Valley; the greater part of it is under cultivation. There are many fine villages and numerous camps of the nomadic clans of Zafaranlu. Cultivation also extended far up the mountain-slopes, which are easy and well covered with soil. Wheat is largely exported, and is carried as far as Jahjarm, and occasionally Sharud, Mash-had, and Sabzawar.

The town of Koochan lies on the north side of the plain and south of the stream. Low hills, with round easy slopes, running out from the northern chain, approach to within a mile of the walls. On the last mound is a terrace known as the Takh-i-Shah (Fath Ali Shah's tents having been pitched there), from which a good view of the town-wall, bazaars, and a great extent of enclosing vineyards and gardens is obtained. The town-wall is dilapidated and the ditch filled in, no attempt having been made to restore the defences since they were destroyed by the troops of Abbas Mirza. The town itself is in a ruinous state, the

result of an earthquake which happened two years ago. South of the town are the ruins of an old fortified enclosure known as the Kurd Muhalla, said to have been the first permanent settlement made in the country. The Geraili Turks, who held the country before the Kurds were imported by Shah Abbas, were nomads, and lived, as many of the Kurds do now on these bleak mountains, winter and summer, in their tents of goat's hair. West of the town a wide, green fertile plain covered with villages stretches for many miles. In summer or late spring the landscape would no doubt be a lovely one. In autumn the bare low hills and brown ploughed land and leafless orchards give it an appearance of desolation which there is nothing to redeem. The Khan being absent in Mash-had, and his son on a plundering party, the town was very quiet, and I entered without creating the usual stir and commotion. Europeans are so seldom seen in the Kurd districts that it requires little notice to collect the people in the streets and on the house-tops in crowds. The crowds are, however, invariably silent and civil, the word "Orus" passed from mouth to mouth in whispers showing their familiarity with the name, if not with the nation.

27th. To Koochan.—Road through the town and central bazaar. The town-walls, or rather their ruins, form a pretty regular square of about 1 mile a-side; they are now much dilapidated. Having suffered from the siege, and lately from the earthquake, the town itself is more than half in ruins, the result also of the earthquake. A large solidly-built Madrassah of masonry that was pointed out to me had been damaged beyond repair; the arched roofs had all fallen in, and with them many feet of the walls. The shock must have been terribly violent. No lives were lost, as there had for some time before been indications of what was coming in the shape of rumblings and slight shocks. The neighbouring villages suffered little; one, about 1 mile east of the town, strangely enough, not at all. The central bazaar showed a good deal of life, and the shops were well stocked and respectable-looking, but the roadway was the very worst I have ever seen; sloughs of mud and filth many feet deep, covered with a couple of inches of water, formed a succession of pools along its whole length: through these struggled lines of unfortunate donkeys breast-deep. The few stones left of the original pavement only served as stumbling-blocks in the way of making matters worse. During the famine the townspeople suffered, but not to any great extent. They are well off as a rule, making money by the sale of wheat and fruit in Mash-had. At the worst time flour was 5 krans per maund. Two or three hundred people are said to have died of hunger. Outside the Mash-had gate a heap of stones was pointed out to me as marking the spot on which an unfortunate wretch,

driven to cannibalism, had been stoned to death by the people. This was said to be a solitary case. The present population is reckoned at 1400; an exaggerated estimate, I am inclined to think, from the size of the town and the extent of the ruins. Many families, however, still live under tents, not having the means to rebuild their houses. A fine stream flows past the north side of the town, irrigating the lands on either bank as far as Shirwan, and eventually falling into the Atrak. Koochan is noted for its fruits, especially grapes, from which a very fair wine is made.

28th.—Rode up the Zoibaran Hill, 9 miles north-east of Koochan. From its summit, 2000 feet above the valley, a good view is obtained of Shirwan and the lower course of the stream, and of the hilly country between Koochan and the Atak and Darehgaz. Behind the Zoibaran is a plateau known as the Daulat Khana, about 12 miles wide, undulating, well cultivated, and drained eastward by a deep hollow, in which lie the villages of Daulat Khana, Kazimabad, and six or seven other hamlets. The soil of the plateau is excellent, and affords wheat-crops, in ordinary years, of not less than ten or fifteen fold. The price of wheat at present in these villages is 6 maunds = 20 seers Indian for a kran, a very low rate for Khorassan. The steeper slopes of the hills also afford grazing for large flocks of sheep and goats. One hamlet of thirty houses that I visited had taken a wheat-crop of 500 kharwars off the ground, and possessed 600 or 700 sheep and goats. The people grumbled at the amount of revenue taken from them, but it appeared not high; ten per cent. of grain, with two per cent. for expenses of collection, one kran per head on the flocks, was the whole demand. Behind the Daulat Khana Plateau is a long stretch of low hills, and then a high range running from west to east with a succession of peaks known as Kuh Chuinli, Kuh Duz, Kuh Kammas, Kuh Imarut. This range cannot be less than 7000 feet high, and is fairly wooded with junipers. Beyond it lies a low range, not visible, at the foot of which are the Akhal Turkoman Settlements. The strata, in all parts where exposed, seem to be violently contorted, bent in double curves, and often on end and perpendicular. The rocks are all stratified sandstones and limestones. A dark-red gritty sandstone I found to contain layers, several inches thick, of minute fossil-shells, which is, I believe, unusual.

29th. Tavil, 24 miles.—Marched from Koochan to Tavil on the road to Darehgaz, having heard for certain that the Khan of Bujnurd would not leave for Teheran till the 7th or 8th of next month (the Mahomedan), *i.e.*, twenty-one days. From Koochan, following the stream, which is said to be a tributary of the Atrak, for a distance of about 16 miles, the mouth of the

defile, from which the stream issues, is reached. Several flourishing Kurd villages lie on the route, and the land is fertile, well tilled, and abundantly watered. Ploughing was going on actively; and I noticed the same individual by turns ploughing, sowing, and harrowing, after the fashion of the country, *i.e.*, by driving a board to which a pair of bullocks are fastened, and on which a stout Kurd finds what must be anything but easy standing, over the open furrows. With a shallow furrow and light dry friable soil this primitive method is more effectual than might be supposed. On the "Dayma" or barani lands the seed is sown broadcast and ploughed in. Threshing was going on with the ploughing, late rain having delayed the operation. Little is grown in this part of the valley save wheat and barley. Cotton does not yield well, though it is grown; the people attribute this to the cold. Snow lies for four months, and the ice bears for two or three weeks at a time. After passing two fine villages, Hy Hy and Chalata, the village Kalla Yusuf Khan, on the border of Radkān and Koochan, is reached. The people, Kurds of the Kywanlu tribe, are a fine-looking set, and apparently better off than their neighbours. Forty or fifty men came out of the village to offer me entertainment with genuine hospitality, and without, I think, an idea of reward or payment. They told me they considered their Khan's guest their guest. The men were all clothed with an under and over-coat of brown wool, home-spun trousers of the same gathered into the "Charrukh," a gaiter and boot made of one piece, of goatskin, fastened by a thong passing through holes at the heel, instep, and toes. All had the comfortable tall sheepskin cap of the country, mostly brown; a few of the younger men wore white caps contrasting well with their brick-dust complexions and brown beards. They were short men, but stout and well made. I noticed a predominance of blue and hazel eyes. Although undoubtedly a Turk or Tartar race, these Kurds show nothing of the Mongol type; their features are handsome, regular, eyes full and prominent, and beards ample. When saluting they raised the open hand to the forehead with head erect and a quick almost military movement, very different from the cringing bend of the Irany and slovenly shuffling salute with half-closed hand of the Persian Serbaz. I told them that their country was a much better one than mine, and better than any I had seen in Persia, and they readily admitted that they were well off. A glance at the group of well-fed, well-clothed, ruddy-looking men, and around at the terraced vineyards, the well-stocked orchards, picturesque in vivid autumn-tints, and beyond over a long stretch of corn-land, dotted with ploughs working lustily, and yellow patches of fresh-threshed

grain, and traversed by silver lines of water from the abundant stream, made one envious of their lot, and wish that our own poor landless serfs had as fair a land in which to live and multiply. To crown all its other gifts, this favoured spot is absolutely secure from Turkoman ravages. East and west, for many miles, it is protected by an almost impassable range of mountains.

From Kalla Yusuf Khan the valley narrows, and after passing the picturesque village of Badkhor of Kywanlu Kurds, the road enters a narrow defile and follows it on north-east for 4 miles. The defile is commanded all along, but the hills are easy and of no height. Guns have been taken through by the Persians in one of their expeditions against the Tejend Turkomans. On reaching the village of Tavari the defile opens, and there is a good stretch of cultivation ½ mile wide and 2 or 3 in length; two streams come in from the low hills on the right, and the main stream divides the valley branching west up to the Daulat-Khana Plateau and east towards Darehgaz, from which direction it receives the Tavil stream, the most distant feeder or source of the Atrak. Tavil is a small hamlet of ten houses of Kywanlu Kurds. The valley or glen in which it is situated is bleak, treeless, and barren, the stream winds through patches of yellow marsh in a dull sluggish current, and the hills are monotonous in outline and colouring, lines of serrated ridge, brown and bare, forming a lofty, unbroken, impassable wall, enclosing the valley and shutting it out from the world.

30th. Chapushlu, 21 miles.—From Tavil to Chapushlu, in the plain of Darehgaz, is a march of only 21 miles (roughly calculated), but a whole day's work. Leaving the village of Tavil and the valley, the road descends a rocky glen to the Maidankhana Pass, 900 feet; there is then a descent of 1600 feet to the Kibkan stream, steep and rough, and thence an ascent of 1100 feet to the Allaho Akbar Pass, the first mile very bad indeed, and a descent of 3000 feet in 3 miles, and of another 1000 feet before reaching the plain. This is the road by which the Persian guns are said to have been taken when Mahomed Shah made one of his spasmodic attempts to subdue his Turkoman neighbours. I have reason to doubt the legend, though light guns, with plenty of manual labour, may be taken almost everywhere. The descent from the Maidankhana plateau at the head of that pass leads into the northern watershed; a small stream rises in the defile, and flows through a curious natural gap in the main ridge of the north spur of Alburz, known as the Derband-i-Kibkan. Beyond the defile is an open valley, in which are the hamlets of Derbend and Kibkan, the first village in the State of Darehgaz. In this valley

the clan of Afshars, to which belonged Nadir Kuli Beg, shepherd and bandit, afterwards Nadir Shah of Persia, were settled by Shah Ismail Seffavi, who brought them from Azerbijan, whither they had emigrated in the track of Tartar hordes from the banks of the Jaxartes. Nadir's house in Maulatabad Dastjart, in the plain of Darehgaz, is still standing, and is known to every peasant in the neighbourhood. The Kibkan stream, after passing the picturesque little fort of Kibkan, situated in what must have once been a very strong position on an isolated hill, flows E.S.E. down a narrow gorge shut in by stupendous precipice to the meadows of Abivert, the winter-quarters of Nadir's family. Abivert or Bavert has a local reputation for surpassing fertility; melons grown there, I was told, attain a weight of 50 lbs., and wheat returned a hundred fold.

For many years the valley had been uninhabited. Both Turkomans and Kurds have settled in it, but found it untenable. Its rich harvests were too great a temptation for plundering neighbours to withstand. The latest attempt at settlement was only last year, when 1000 families of Alieli Turkomans, immigrants from Khiva, after the Russian occupation, pitched their tents there. They were, however, removed by the Khan of Darehgaz, who, it appears, feared the alienation of the lands, for the new immigrants came as crown tenants. They were removed to the lands of Durgana and Kalkhan, in the Atak, beyond Darehgaz, in which there are now 3000 families of Turkomans, Kurds and Turks paying tribute to the Khan.

From the Kibkan stream there is a long, stiff climb to the summit of the spur and the pass of Allaho Akbar. From the crest of the pass is a fine view of the plain of Dahregaz, lying 3000 feet below. A line of watch-towers along the spur, still in good repair, show the precarious tenure on which the fertile lands are held. The towers guard every foot-path, and the precipitous ridge forms the last refuge of the villagers when driven out by an attacking force. Only two years ago, in the spring of 1872, a body of, it is said, 3000 Tekkeh horses and 2000 footmen invaded the valley and "chapoued," or sacked, the village of Chapushlu, forcing the gates and carrying off 1500 of the people with all their goods and cattle. The house of my host the Khan' was their headquarters for some days, and still shows signs of their rude occupation.

The descent from the pass is steep, but over an unusually good road, evidently made at some former time, and not the mere ordinary track.. There is a noticeable alteration in the vegetation of the north slopes; grass takes the place of withered thorny herbage, and shrubs appear in the moist glen. The plain is green and fertile, and studded with white-walled

villages, vineyards, gardens, and groups of chinars in brilliant autumn foliage. Tall watch-towers, in good repair, and evidently in daily use, dot the plain in every direction.

The village of Chapushlu is defended by a good wall and ditch, enclosing a space of about 500 yards square. The population consists now of 1000 families, mostly of Turkish origin, brought over by Nadir from Bokhara. Cotton, tobacco, wheat, barley, lucern, and millet are grown, with every kind of fruit. During the bad famine years there was little scarcity, and there were no deaths. The people had crops of grain, though small, and a great store of wheat in their houses.

31*st.* *To Mohamad Bagh*, 8 *miles.*—Marched from Chapushlu to Mohamad Bagh, 8 miles, through vineyards, gardens, and over a well-cultivated plain. At 4 miles the road passes through a gap in a low spur running out into the plain from the east and bending north-east, and down an easy slope to the village. From the high ground the plain and village, with a belt of two or three miles of grove, garden, and vineyard, looking picturesque enough, though there was nothing in the mud-walls and flat roofs to assist nature. An escort of 40 horsemen with the Khan's brother (the Khan himself being absent at Mash-had) accompanied me more for show than for protection, as in ordinary times the plain is safe. The men were fair specimens of the border Kurds and Turks, short, light, hardy, and excellent riders. Their horses were all good, serviceable animals, and one or two remarkably fine. A fine grey, not under 17 hands, well shaped, and with splendid action, was ridden in front of the party. He had lately been purchased for 200*l.* The Khan of Darehgaz has 800 horse in his pay, and always ready for foray or pursuit. They are mounted, armed, and paid by the Khan as a condition of tenure of his State. I was surprised to find that no more than these 800 men could be raised. The villagers have no horses, and the Khan no stud. He is entirely dependent on the Turkomans for remounts. This is the case also with Koochan. A couple of thousand footmen, badly armed with matchlocks, might be raised from the villages on an emergency.

Mohamad Bagh is defended by a strong outer wall on a good rampart with a deep and wide ditch. There is an inner line of wall with towers. The rampart and ditch are, as usual, deficient in flanking defences, but the place is altogether stronger than the forts of the country usually are.

In the afternoon, the Khan's brother and son, a good-looking lad of 16, came to visit me. They had been out with a party to protect the people of one of the border villages while employed in getting in some rice two miles from their village,—

a fair illustration of the state of insecurity of the country. The border-villages, those in the Atak outside the hills, are always liable to attack, and it is even unsafe to move before sunrise or after sunset on the edge of the plain within the hills, for small plundering parties are always lying hidden in some ravine on the look-out for chance cattle or flocks insufficiently protected. At times a large body of Turkomans will scour the whole plains, shutting the people up in the forts or driving them into the hills. This may happen once every year at least. Attah Yar Khan, the present Chief, has a tighter hold on the border than his predecessor, and is on better terms with the Turkomans; but he has often to buy off his enemies, and is at their mercy if they choose to combine. The Akhal settlements can with ease bring 5000 horsemen against any point on the border, and supplement these with 2000 or 3000 footmen if necessary.

November 1st.—Rode out with an escort of 40 horsemen to visit some of the settlements in the Atak. The villages, Khairabad, Turan, and Atak, lie a couple of miles from the last low range of hills at the mouth of the pass. They are all defended by good walls with towers and ditches. A guard of armed villagers is kept at the gates, and a watch on the wall to guard against surprise, for it has happened that the Turkomans have ridden right into a village before the people had time to get their arms. Every field has its tower to give shelter against a sudden attack, and the villagers go to their work with matchlock and sword, waiting till the sun is well up and taking care to get in before sunset. A long line of 50 horsemen passed us, each man armed and carrying a couple of bags of husked rice slung behind the saddle, so fastened as to be cut loose at a moment's notice. They were thus prepared for either fight or flight. The rice-fields are 16 miles down the course of a small stream running off the plain of Darehgaz; there are a few towers built for protection, but no fixed settlement. The crops are as often reaped by the Turkomans as by the lawful owners. This year hardly any attempt has been made to interfere with the harvest-work. The people attribute this to the Russians, who have given the Turkomans other occupation. I found myself usually taken for a Russian, and my men were everywhere asked whether I had come to pioneer the Russian force that was to finish the business and bring all the Turkomans under Russian sway. The poor villagers of the Atak would certainly accept Russian rule as a boon if it brought with it security from the constant attacks of their marauding neighbours,—a security that their own Government is unable to give them. I was informed credibly that there was

not a house in the 20 Atak villages that had not lost some member killed or carried off into hopeless slavery. The price for which a man can be ransomed is from 25 to 50 tomans,—a sum far beyond the reach of an ordinary villager.

The Atak villages pay no revenue, but they are valuable as an outer line of defence, and serve also to keep the enemy at a greater distance. Beyond these to the west are some Turkoman camps, which pay a small tribute to the Khan of Darehgaz for immunity from attacks, and are useful in furnishing information of projected "Alamans," and in negotiating for the ransom of prisoners.

For the first few miles from the foot of the hills, the soil of the Atak is poor and sandy. It is in many parts also saline, and covered with saline efflorescence. Further out it becomes more fertile. The fertile belt extends from 4 to 5 to 16 and 20 miles, and is then lost in a sandy waste that extends to the Caspian and Aral.

3rd. Darehgaz Plain.—Rode out to the west of the valley, following a small stream flowing from the range dividing Koochan from the Atak. There are numerous large villages along the course of the stream, the largest from 100 to 150 houses, with an average of from six to seven souls to each house or family; this high average being evidently due to the fact that there had been no losses during the famine. Even with large tracts of "dayma," or unirrigated land yielding ten to fifteen fold crops, and only a small urban population, the produce of the plain does not more than suffice for the wants of the inhabitants. A small quantity finds its way to Mash-had, but scarcely pays for portage over the difficult mountain-pass. An average grain-production of 400 kharwars for every 100 houses in the valley may be taken as a fair calculation, leaving a balance of half a kharwar as surplus produce per 100 houses. Allowing 2000 or 2500 houses as the population of the valley, the surplus produce would amount to 72,500 kharwars in a good season.

Cultivation in the valley and Atak is capable of an almost unlimited increase on unirrigated lands in both, on irrigable lands in the latter. A very small quantity of silk is raised, and some cotton, tobacco, and opium, the latter for home consumption. A few years ago its use was unknown. Now it is largely consumed by all classes; but more especially by the Khans and their followers. During the present month (Ramzan), a month of fasting, the day is always wound up with intoxicating doses of the fumes of this drug. In the evening I met the Khan's brother and a number of Mollahs and Khans, visitors from other places. The antiquities of the valley and of

Khorassan were discussed. The famous legend of the giant-tree of Tereshez, mentioned in Yule's 'Marco Polo,' in the author's notes regarding the Arbre Sec or Seal of Polo, was related with much exaggeration and amplification. Neither this plain nor the neighbouring Atak appear to have been very ancient seats of population. The only coins found are said to bear invariably the inscription of the Khalifate, and the only building of very great antiquity is an Imamzada with an illegible Arabic inscription. There are said to be remains of an ancient city of Alivert, but a number of gold coins, found there by the Turkomans last year, are also said to have been all of the Arab period. The common Sassanian coins of Khorassan appear to be unknown as a product of the place, though recognised as Suckre coins by the Mollahs. As a central point in the battle-ground of Iran and Turan, it is perhaps not surprising that the valley, though fertile, should have had no settled population.

4th.—Three Persian escaped slaves from Bokhara, who had just arrived with a caravan from Merv, came to me in the evening. One of them had been captured as a boy, and was now returning to his home a grey-bearded man. He had left at home a father, brother, and sisters, of whom he had heard no news during his long captivity. Another was a soldier of the 6th Regiment of Azerbaijan, who had been captured at the time of the defeat of the Hashmat-ud-dowla at Merv. He acknowledged with great glee that he had robbed his master before escaping, and paid him off many old scores. The third was a Syud of Turbut. They were forty days from Bokhara.

6th.—Marched with the Khan's son, and a guard of 100 men, to Nowkhandan, a large village lying some miles up the course of the Darehgaz stream.

Nowkhandan is the property of the Khan's two brothers, Syud Mahomed and Mahomed Khan; it is prettily situated on undulating ground between the mountains enclosing the plain to the north, and a low ridge that traverses it from east to west. On a high circular mound is a mud fort, which contains the Khan's residence, and commands the whole village; around are extensive orchards, groves, and vineyards, extending for 2 or 3 miles up and down the stream. The grapes of Nowkhandan have a great local reputation, and I found that very good wine was made and sold without the usual intervention of a Jew or Armenian to take on his shoulders the sin of the consumer. The village has 700 houses and a population of 2500 Turks and Kurds.

7th. To Durangar, 24 *miles.*—From Nowkhandan, the road lies up-stream, following its course to the skirt of the plain, and up a defile which gradually narrows till it reaches the

village Sang Surakh, where it passes through a curious natural gap in a depression of the spur on the left of the defile, and into a second valley more open, level, and covered with fine pasture. Back from Sang Surakh, about due north, runs a glen, up which lies an easy pass to the villages of Askabad and Annau in the Atak. These are large Turkoman settlements, and the road is consequently dangerous. The day previous to my arrival at a little Kurd hamlet on the road, named Zainadillo, after its inhabitants were attacked and three men carried off, my escort had orders from the Khan to retaliate on the nearest "obahs" of Askabad after leaving me at Koochan. Durangar is a collection of hamlets, four in number, on the banks of the Darehgaz, or as it is called Durangar stream. The outlying up-streams are known as Durangar-i-Turki, the lower hamlets Durangar-i-Kurdi; they muster altogether about 200 Tofangchis, which would give a population of from 1000 to 1200 souls. The hamlets are all defended by good walls and towers, and the men always armed; being so near the border, they are constantly liable to attack. I was surprised to find the men very indifferent shots: some of the best marksmen in the village were collected for me, but failed, after ten minutes' fusilade, in hitting a large mark at 120 yards. The rifles were heavy and supported by a forked rest, so that the fault must have been in the rifling. The fact is that, although they boast of splitting bullets on a knife and such like, they know nothing of the fine shooting obtained from European rifles. If they can hit a moufflon at 50 yards, and a horseman at 150, it is all they expect and require. From Durangar Kurdi a pass leads to the large Kurd village Kalla Chinor, the last on the border. It is said to stand on an elevation directly over the Turkoman "obahs," and only a mile or two from them: weather permitting, it is arranged to go there to-morrow. On a cloudy day it is useless. The distance from Durangar to Askabad is about 8 miles.

8th. To Imamguli, 20 miles.—The day broke with a high wind and a storm of snow, the ascent to Kalla Chinor was therefore useless. Marched for Imamguli in the Koochan country. A few miles above Durangar, the stream along which the road passes to that point turns west, issuing from a narrow gorge overhung by steep cliffs. Following the stream for 10 or 15 miles through the defile, the large villages of Shorak and Durbadam are reached, and above them the sources of the stream. The road crosses the stream and continues up an open glen which narrows to the foot of the Dawand Pass, by which the plateau of Koochan is reached. On the rest of the pass the storm came down in earnest. A cold blast from the north drove the snow in clouds before it, obscuring all save

the path under our feet, and that was rendered difficult by drifts of snow collected among the boulders through which the horses floundered with difficulty. The pass is, however, a very easy one, the gradients nowhere steep, and the hill-sides safe and free from rock. A very small amount of labour would serve to open a road practicable for guns or waggons from the Atak of Darehgaz on to the plateau and thence to the plain of Koochan. No more practicable route exists to the east of Koochan. Imamgoali is a village of about 100 houses, situated on a hollow of a high bleak plateau, draining west into the Durangar stream. It is destitute of gardens or vineyards, but has plenty of fine cornland on the hill-slopes. The inhabitants are Zafaranlu Kurds, under the rule of the Khan of Koochan.

9th.—Took leave of the Khan and his party, and marched with one guide to Isfirji, a large village lying buried in a rocky glen on the south face of the main range. The thermometer at sunrise stood at 5° Fahrenheit, and the little stream flowing past the village was frozen hard, the swift current barely forcing its way through ice and boulders. Leaving the Zublilig Plateau, the road turns south over low, bleak-wind-swept hills covered with snow, and, gaining the crest of the pass, descends into one of the characteristic plateaus of this section of Alburz. The plateau known as Takhta or table of Katerchi, has a width of 5 to 8 miles, with a length of 15; the central portion is tolerably level, and a great breadth is ploughed and sown with wheat. This operation is simple enough. As much seed as the cultivator has to spare is sown broadcast over the hill-slope, and ploughed in with a light plough to a depth of 3 or 4 inches, With favourable rain, good crops are taken off such land; the seed returning ten, fifteen, and twenty fold. The sides of the plain are undulating, and rise into low, easy hills, entirely bare of trees, as is the central portion also. At the lower end these undulations become bolder and meet, forming a narrow defile, through which runs a small stream, finding its way to the deep valley of Durangar, and thence to Darehgaz and the Atak. Crossing the Ahmuli Ridge—a low ridge which may be taken to be the watershed of this very intricate network of hills—the road enters the Daulatkhana Plateau, exactly similar in its features to the last, but wider and longer, and draining south-east instead of north-west, and eventually west into the Atrak instead of into the Darehgaz stream. Beyond Daulatkhana lies Koochan. Leaving the crest of the plateau, there is a descent as off the edge of a table into the deep valley of Shorazun, which names a large village lying in it, and drains directly into the Koochan stream. On reaching the level of the valley, the snow disappeared and a few trees began to show along the course of the

stream flowing through it. The few villages in the upper part of the valley have a desolate appearance. There are no gardens and very few trees, and no crops; some wheat and barley can be raised. The people are almost entirely dependent on their "dayma" (unirrigated) crops on the slopes of the mountains. It is not till the lower end of the valley is reached that the landscape improves. A small tributary joins the main stream just about the gorge by which it reaches the Koochan Plain; on the banks of this lies the fine village of Isfirji, which alone would make the valley worth a visit. The hill-sides are covered with terraced vineyards and orchards, and the village and stream half-surrounded by groves of plane and poplar. The finest fruit in Khorassan is said to be grown here, and finds its way to the market of Mash-had and Sabzawar; the apples, pears, and grapes, were superior to any that I had seen in Persia, and equal probably to the best in Europe. The village has eighty houses, many of them in a ruinous condition from the effects of an earthquake; the same that was felt so severely at Koochan. One other village only, besides Isfirji, suffered in the same manner, and it is on the same line, being north-west of it. The shock appears to have travelled from north-west to south-east, and to have been violent only along the line of the villages and Koochan, a length of about 15 miles. The revenue paid is almost nominal, a large portion of the village being held in fief by relatives of the Khan of Koochan. The wheat-lands of the glen are said to be particularly productive, the price (within reach of a market at Mash-had) being 35 lbs. of wheat per kran = 10*d.*

10*th. Shirwan,* 24 *miles.*—Marched to Shirwan across the plain of Koochan. A short 2 miles beyond Isfirji, in a narrow pass known as the Darbund-i-Hissar, through which the road and the small stream from the Shorazun Valley debouche on the plain. On both sides of the pass are precipitous heights, those on the right named the Dagh-i-Shah, Shah Abbas Safavi having ascended the highest point to obtain a view of the plain. It is about midway between Koochan and Shirwan, commanding a fine view of both, and of the whole plain from Jafirabad to Chinnaran on the Bujnurd road. The summits of the Mirabad or Nishabur Range are visible to the south-east, completing the circle of mountains in that direction, and to the west the valley leading up to Bujnurd is closed by the snow-clad ridge of Kuh Salig. South-west across the plain is the Kuh-Shah Jehan, the south spurs of which stretch out into the Jouven Valley. Clearing the pass the road strikes across the plain, which at this point has a width from the lower slopes of Shah Jehan to the fort of the Dagh-i-Shah of about 20 miles.

The hill-slopes, running for 30 miles into the plain, afford fine pasturage, and are in parts ploughed up for ("barani") rain-crops. The central portion, through which flows the Koochan stream, is thoroughly well irrigated, and has many large villages, gardens, and vineyards. A marked peculiarity in the landscape is the circular flat-topped mound to be seen near such large villages. These mounds are from 50 to 100 feet in height, with a diameter of 200 to 300 yards. These may have been either forts or the sites of Guebre fire-temples. The people could give no account of them, further than that they had heard tell that they were built by Rustum as watch-towers at the time of Afrasyab's invasion. The town of Shirwan lies on the right bank of the stream, 30 miles from the southern mountains. A high mound in the centre of the town is visible from 10 miles. Large gardens and vineyards lie to the north and west.

11*th*. *Shirwan.*—Halted at Shirwan. Received a visit from the Menghashi, a very intelligent, communicative official. His hospitality was spontaneous; for he had had no orders from the Khan, who is still absent, to entertain me. I gathered from him a good deal of useful information regarding the town and the state of the country. Shirwan is situated at the lower or west end of the plain of Koochan, within 3 or 4 miles of the hills, bounding it on the south; to the north the plain stretches away for 15 or 20 miles. The enclosing hills in that direction are low, and of less bold outline than in other parts of the range. Several good roads lead over them to the Atak or plain, distant 30 miles. The main road debouches at Yang-i-Kalla, and is said to be passable for guns, but not easier than the road between Darehgaz and Koochan. Ten miles from the plain is a plateau known as the Kushkhana, on which are thirty villages, the largest Khairrhat.

The people are Kurds, Turks, and a few families from Mehna, one of the old towns, formerly large and populous, the ruins of which are said to cover a large extent of ground near Yang-i-Kalla. The Mehnais were and are still Sunnis, and were in possession at the time of the Kurd occupation. They were gradually forced out of the plain by the pressure of the aggressive Turkoman tribes. I was unable to obtain any information as to the origin of these former occupants of the Atak. They are known now only by the names of the towns they occupied—Annoni, Askabadis, Mehnais—as the case may be. They were probably immigrants or invaders from Turkistan subsequent to the Tartar conquests, whence their distinction from the other Turkish tribes of Iran. The plateau of Kushkhana has a population of 3000 or 4000, and furnishes 300 well-mounted

horse, and 100 or 200 riflemen. Beyond the plateau are the larger villages of Feroza and Gurmah, each with 80 to 100 houses, in strong positions within a few miles of the border. The town of Shirwan has 1000 families, all Turks, of the Gerayli tribe, who formerly held the whole country from Gurgan to Kelat. The Jellayer of that place, the Boguiry of the north villages of Jouvain, and the Beyat of Nishabur and other parts, are sections of the same tribe. They have mixed and intermixed with the Kurds who were settled among them by Shah Abbas. There is now no distinction in language or feature. The greater part of the population is engaged in agriculture, there being but a small proportion living by trade or handicrafts. A few carpets are made, and a good deal of the coarse silk stuffs known as Allahji-bafi, chiefly by the women, for home consumption. The streets of the town are wide, well paved, and tolerably clean, and its appearance is altogether more inviting than that of Koochan, the earthquake that devastated that two years ago having been scarcely felt here. The walls, forming an irregular figure of six sides, with a circuit of 1½ mile, are in fair repair. The rampart has a height of about 25 feet, with base of 15 to 18 feet, and screen-wall of good thickness, but without any ditch. The mound in the centre commands the ground all round, and is large enough to form a good position. It would add very materially to the strength of the place. The water-supply is good and ample, and the climate is considered by the people the best in Khorassan, and therefore in Persia; there are occasional visitations of cholera, sometimes of extreme severity. During the famine the people did not suffer, but many hundreds who collected from other parts died in the town. At that that time grain was selling at 4 krans per maund (7 lbs.); it is now 5 maunds or 35 lbs. per kran; a considerable quantity of wheat is exported to Mash-had. Two or three hundred of the townsmen, forty or fifty mounted and armed with the "Shamkhal," a long heavy rifle, the rest with the "Khirli," a lighter piece, carrying a very small ball about thirty to the pound up to 200 yards with great accuracy, are in the pay of the Khan, and serve on the border when required. They receive 6 tomans (24) per annum, and 2 kharwars of grain per annum, the regular horsemen armed by the Khan receiving from 10 to 30 tomans, and the same quantity of grain. Koochan, with its two considerable towns, its fertile land, and large and flourishing population, is altogether the most important of the border States. It is said to have 440 villages, probably an exaggeration. Those in the plain may number 80 to 100, and the hill-skirts and mountains may have 50 or 60 more. The population is said to be 40,000 houses and tents, which, cal-

culating five to a house, would give 200,000, probably not much over the mark, for the towns are populous, and many of the villages large. They have also not suffered from the famine, the most striking proof of that being a large number of children of all ages. In other parts of Khorassan it is rare to see a child of more than two or three years of age. A nominal revenue of 40,000 tomans per annum is paid to the Shah, but a portion of it is returned as pay of border guards. The Khan maintains 1000 horsemen, mounted chiefly at his expense.

12th. Chinnaran, 22 miles.—Marched to Chinnaran. On leaving the gate of the town a sheet of bare rock on the hill-side to the south gives a very good representation of a tiger, whence the name Shirwan. The Bujnurd road turns out of the valley at about 3 miles, passing over a low spur and a fine plateau known as the Hazar Jarib, whence a long but easy defile leads into the Bujnurd Plain. There is an alternative road leading straight down the valley and through a pass closed by the mud fort of Rezabad, built by Reza Gull Khan, the rebel Ilkhani of Zafaranlu, in the time of Fateh Ali Shah, into the Germekhas Valley, whence it strikes across a very difficult-looking broken country westwards to Bujnurd. This road is used, but not frequently. Caravans and troops always choose the first mentioned. The pass and the descent into the bed of the stream draining the Hazar Jarib Plateau would be an obstacle to guns, but it is turned by a route which, leaving the village of Zobaran at the head of the plateau, passes for some miles over a low ridge, broken only by easy undulations, and descends into the Koochan Plain over the village of Mushtarji, and joins the main road from Shirwan at Parez, a large village 8 miles distant from that plain. Six field-guns of the Shah's escort were driven across the path without difficulty. Two and a half miles from Shirwan is a fine spring, known as the Kara Kazan Spring, and considered by the people the source of the Atrak, the main stream being dry in the summer. There is a higher permanent source about 15 miles north-east, draining the Khuskhana Plateau and joining the Germekhas stream at Mana, 30 miles north-west. From the summit of the Kanah Ajab, 10 miles north-west of Shirwan, and 2000 feet above the level of the valley, a fine view is obtained of the Koochan and Bujnurd plains, of the watershed of the Atrak as far as the last height skirting the Gurgan Plains, and of all the principal peaks of the eastern Alburz.

13th. Bujnurd, 14 miles.—Marched to Bujnurd. Leaving Chinnaran the Bujnurd road follows a narrow, well-cultivated glen, known as the Germekhas-i-Chinnaran. The hills on either side are of chalk and coloured loams, low, and easy of

access. At a few miles from the village the road turns out of the glen over long undulating downs, and the stream disappears in a narrow gorge leading to the Germekhas Valley, which it enters 8 or 9 miles further north-west. From the crest of the downs the plain of Bujnurd is opened to view. The town standing in the centre of the plain is small, almost destitute of the gardens and vineyards which give so picturesque an aspect to the towns and villages in Darehgaz and Koochan. From north to south the plain has a length of about 20 miles, and a width of 8 to 10. It is drained by a small stream, which passes through a high range of hills dividing the plain from Germekhas Valley. Thirteen villages are visible along the course of the stream and on the hill-skirts, of which two or three only are of considerable size—the lofty rugged peak of Aladagh and a massive-looking mountain known as the Kuh-i-Turga or Salig. Close to the south beyond them lie the Jouvain and Jagatai valleys. At a short distance from the town I was met by the Khan's Mustaufi and an "isticbal" party, and conducted to quarters in a very handsome building, with some fine rooms, decorated in the Persian style with plaster, gay colours, and carved wood-work.

The Atrak route from Bujnurd to Astrabad appears to be quite impracticable, at least from the Persian side, and under their protection. For 50 miles there are no villages, and the wilderness—it is by no means a desert—is constantly swept by "Alaman" of Yomuts and Tekkeh, *en route* to the Goklan Settlements, or the border districts of Khorassan. A thousand horsemen would hardly ensure safety. Caravans pass occasionally by travelling at night, and with great expedition.

15*th*. *Bujnurd.*—Visited the Ilkhani, and had a long conversation with him relative to routes. That along the Atrak was, he declared, absolutely impracticable. I saw that there was still little hope either of obtaining a guard from the Chief or of using him as a medium of communication with the Yomuts. It was not his interest to assist me in the matter, and I could bring no pressure to bear upon him. The Gurgan route, which I also suggested, in the hope of getting from that place to the Atrak, was, he said, safe as far as Gurgan, as he could furnish a sufficient guard; but thence the Yomuts held a good deal of the road, and were decidedly unfriendly both towards his men and the Goklans, whose "obahs" also intervened.

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18*th*. *To Shaoghan.*—Marched to Shaoghan, on the road to Jajarm, and Bostam, a village of 100 houses of Shahdillu Kurds, with large gardens and a great extent of unirrigated

wheat-lands giving good crops. This year the harvest was exceptionally good, and consequently wheat is selling at seven maunds per kran.* In the worst year of the late famine the unirrigated lands gave a crop sufficient to maintain the population and a good many of the famine-stricken inhabitants of the less fertile valleys to the south.

For the last two or three years also, though situated within a few miles of the passes through which the Turkoman "Allamans" constantly pass, the village has enjoyed a certain amount of immunity from plunder.

From the Bujnurd Plain the road crosses a low pass, and thence bends from south to west between two grand masses of mountains, connected by a low, narrow ridge, over which it also passes. The mountain to the right, or north, is known as the Aladagh, or the "piebald mountain," a name very commonly applied to mountains high enough to retain patches of snow late into the summer. The southern mountain is as high as and a greater mass than Aladagh. The north face, for about 1800 feet, was thickly covered with fresh-fallen snow, and is well clothed with juniper of fair growth. To the east of the peak, and about 16 miles south of Bujnurd, is a deep cleft, with precipitous sides rising to 1500 feet above the valley known as the Siahkhana, through which lies the direct road to the Isferayin Valley, and thence to the Jouvain and Nishabur plains. To the east of the pass again the ridge falls away, and is crossed by a second and easier pass, 6 or 8 miles from the Siahkhana. Thence it rises again, joining the high range in which lie the plateaux of Buguiri and Sultan Maidan; the principal peaks, Shahjehan and Mirzakhana, reach an elevation of 7000 to 8000 feet. Bending from south to south-east beyond Koochan, this range runs past Mash-had, through Bakharz, towards Herat.

Leaving the baggage to follow the easy road over the low ridge connecting the two mountains, I ascended the peak of Aladagh, known as Baba Buland. The ascent was steep and difficult, the path being frequently obstructed by deep drifts of snow, through which our horses struggled with difficulty; but the view from the summit well repaid the exertion. To the east the mountain falls abruptly into a glen, which carries the drainage of its east slope, and of the north slopes of the Salig Mountains, into the Bujnurd Plain and into the Germekhas tributary of the Atrak. To the west it continues in a high, unbroken ridge, dividing the drainage-basins of the Atrak and Gurgan for 50 to 60 miles, where it is lost in the fertile plain dividing the two rivers.

* Equal to about 42 lbs.

The slopes at the base of the Aladagh are formed of a coarse, gritty sandstone, overlying which to the summit is a stratum of grey limestone, showing a few impressions of ammonite. The strata dip at a sharp angle to the north, and the south face of the mountain descends in bold spurs. The aneroid marked an ascent of 4600 feet; a bitterly cold, north-west wind sweeping the bare mountain-top, baffled all attempts to obtain a reading of the boiling-point.

In the days of the Safavian Kings, the Royal road, from the Caspian Provinces across the Gurgan Plain, led up the Shaoghan Valley. A wide road, clearing the Gurgan Pass, or gorge, 50 miles lower down the valley, is now said to be covered with impenetrable forest; and two ruined hostels, known by tradition as the Rabat-i-Ask and Rabat-i-Karaguez, only remain to bring the past into contrast with the present. From Shaoghan to the plain, and many miles beyond, there is no sign of human habitation. The ever green and fertile meadow-lands, the produce of which would suffice to save a whole district from famine, form the neutral ground between plundering Turkomans and Kurds, and thus it is with all the fairest valleys of Khorassan.

19th. To Sanghas, 18½ miles.—Marched to the village of Sanghas, or "Chardeh," so called from its being the principal of a group of four villages. The other three villages are Andigan and Jurba, in the plain west of Sanghas, and Khoda Shah to the north. A fifth village, Kofr, lying at the mouth of the pass from Bujnurd, belongs to the group. Sanghas and the three first-mentioned villages lie well out in the plain, not less than 10 miles from the pass. To the south, distant 4 to 5 miles, is a low ridge, beyond which lies the Plain of Jouvain; east and west is an almost unbroken level waste as far as Nishabur on the one side and Bostam on the other. The village lands, of a light-coloured but rich loamy alluvium, are well-watered by a small stream flowing from the Hissar (Bujnurd) Pass. The water of the stream, in common with all the water of the plain, is brackish, but serves for irrigation, and is not undrinkable even to those not habituated to its use.

For more than a mile round Sanghas the ground is covered with remains of ruined houses and walled gardens. On inquiry, I found that the evident decrease in the population was not due to the famine, for it had fallen lightly on these villages. The fine springs forming the source of their water-supply had not been materially affected by the three years' drought, but had continued to yield sufficient to irrigate the village lands and to support the population. The true causes are obscure. Within the recollection of the predecessors of the present oldest inhabi-

tant, from whom I received the information, Sanghas numbered 750 houses; it has now only 200. Numerous kanats (underground water-courses), almost all traces of which are now obliterated, supplemented the supply from the stream. This decline may possibly be attributed to a long period of neglect, misgovernment, and insecurity; but these causes alone seem insufficient. For ten years the people have enjoyed absolute immunity from Turkoman ravages, and a light and fixed revenue demand; but there has been no proportional increase in cultivation or population. Deficient water-supply would alone suffice to produce the results visible, and the deficiency may be attributable either to a decline of industry or to actual decrease of rainfall. The latter has not been observed, and is not admitted; but the former is disproved by the aspect of the people, of their dwellings and their fields, and the evidence of care in husbanding and distributing the available supply of water.

The people of Sanghas and the minor villages are, according to their own account, Uzbegs, brought from Bokhara at some long-forgotten period, probably by Mahomed Shaibany, who is known to have transferred a number of Persians to Bokhara. They number 1000 houses, and, though known as Uzbegs, are now undistinguishable in features from the Azans or Persians and the Kurds and Turks, with whom they have mingled. An ascent of the Kuh-i-Buhar, a few miles to the west of the route, afforded a fair view of all the principal passes used by the Turkomans as far as Nardin, distant about 20 miles. The main chain of the Alburz is for that distance broken into low disconnected ridges, between which intervene wide expanses of ravine-cleft pasture-lands. Nothing but a line of strong forts at short distances would suffice to protect the border on the interior line, but the outer line of mountains or Kuh-i-Atak is much more connected and difficult of access, and it is probable that a few well-placed posts would cover the whole of the interior and fertile mountain-tracts.

Beyond Nardin the ridge rises again, and continues in an unbroken line westward. The Buhar Ridge has the same geological formation as the Jagatai Mountains on the south side of the plain. Trap-rock predominates, and the dark rich soil afforded by these supports a more than ordinarily luxuriant vegetation. The "Dayma" or unirrigated wheat-crops on the mountain-slopes were particularly praised; the yield being 10 to 15 fold more than in other parts. On the base of the mountain a few granite boulders indicated the existence of a solid base of plutonic rock underlying the whole range. The north slopes showed limestone and traps of various colours and texture, worn

down into easy slopes; the summit and eastern slopes, for 1500 feet, a close-grained slaty sandstone, with indistinct impressions of fossil-shells and very distinct ripple-marks on the cleavage surface. Below the sandstone was a stratum of some 100 feet of porphyritic conglomerate, underlying which and facing the lower slopes of the mountains were the mottled clays and marls of the brightest colours in juxtaposition, which give so picturesque an aspect to the lower slopes of the opposite range. A good deal of talc was mixed with the clay, and beds of pure white gypsum, much used by the villagers, were frequent. Trap-rocks, amygdaloids and trap-tuffs showed everywhere, and all the boldest and most precipitous spurs were composed entirely of it. On the bare slopes of the mountains, to the east, the same arrangement of rock was apparent. Dark seams of trap-rock, lying between grey and purple sandstones and mottled marls, and crowning low projecting spurs of red and ochrous clays. Copper and lead are said to have been found on Buhar, but never worked. Of the presence of the former there were numerous indications. The highest ridge of the mountain rises to about 7000 feet.

20th. Jajarm, 20 *miles.*—From Sanghas to Jajarm is a distance of 20 miles over a level plain. The soil a light alluvium, highly impregnated with salt, and but scantily covered with the usual herbage of such lands, dwarf *mimosa* and *salsola* of various kinds. Save two or three small springs at the foot of the hills, distant three or four miles to the right, there is no potable water. The mounds of ruined kanats here and there prove the existence in former times of villages, but the waste is now abandoned to the "Gorkhar" and gazelle and the Turkoman raiders, who have been probably the main instrument in reducing it to its present state. The four passes most used by the "Alamans" lie to the right of the route. They are watched closely, but the post can be turned by many footpaths leading through the mountains, over which the active Turkoman horses find little difficulty in scrambling. The posts also are never strong enough to oppose the passage of the enemy. The two or three horsemen told off for the duty only venturing out after sunrise, when they are assured the coast is clear, to search for tracks along the practicable paths. If fresh traces of the passage of horsemen are found, a signal fire is lighted, the smoke of which warns the villagers below to betake themselves with their cattle to the nearest fort.

The whole route as far as Jajarm is dotted with small cairns marking the spot where some unfortunate has lost his life in the attempt to defend his property or his liberty. For many months past, however, the road has been as safe as roads in

Persia usually are. Small parties of thieves lurk about the hill-skirts, but the extensive ravages of former years have ceased. Between the Kuh-i-Buhar and Kuh-i-Chukah, which lies to the west, is the easiest and most used pass leading from the Rabat-i-Ask in the Shaoghan Valley. It has a spring of water which enables the raiders to make the distance to the Alhaq spring on the high road of Khorassan, over 40 miles, in one stretch. Beyond the Kuh-i-Chukah, which is steep and rugged, and rises to 2000 or 3000 feet in height above the plain, is a long low ridge known as the Tangah, over which are three easy passes—the Gulbini, Tang-i-Gazi, and Gudor-i-Kuhsar; west of the ridge the fort of Jajarm and a lofty mountain to the west of the fort close the road for many miles.

Jajarm is a small straggling town of 400 houses, lying in the south-west corner of the Isferayin Plain. To the north are ridges of the main range, to the west, two miles distant, a rugged offshoot of that range known as the Kuhbaba. The site being suggested as possibly that of Hecatompylos, the Parthian capital, I took some trouble to ascertain the existence of any ruins or antiquities. In the centre of the town is one of the high circular mounds, so frequently met with in northern Khorassan, surmounted by the ruins of a mud fort of no very ancient date. It bears the name of Ali Verdi Khan, the first chief of the Geraili Toorks settled in the country. A small Imamzada, lying a mile to the south-east of the walls, contains a tomb covered with large blue tiles, on which are verses from the Koran; near it are the ruins of a small stone building apparently of quite recent date, but said by the people to be older than the town. For some miles to the south the ground is covered with fragments of small red-brick and blue-glazed tiles, indicating the site of one of the towns founded after the Arab occupation, to which also the peculiar form of the modern name also points. Further, to the east are the ruins of two mud forts raised on mounds similar to that within the town, having nothing to mark their age or origin; three miles to the north-west is a stone fort crowning a low isolated limestone rock, in good preservation, and apparently of modern construction. The rock within the walls is pierced by a shaft to a depth of about 100 feet, from which, it is said, a communication exists with the village of Garma, half a mile to the west. That the excavation was never of use as a well was evident from the remains of a number of large earthen vessels built into the foot of the outer wall, which could only have been provided as receptacles for storing water. The only coins known to have been found are some silver pieces stamped (it is said) on one

side with the usual inscription of the "Khalifat," on the other, with the name of the city of Jajarm. There are no visible traces of remains other than those of a small town of the period of Arab occupation, the dispersion of fragments of masonry to so great a distance being accounted for by the fact that the plain is liable to sudden inundation from the mountains to the north. That the present population of Jajarm, 400 families, is only a remnant, is clear from the great extent of the old walls; in the time of Nadir Shah there were some 5000 families, and as late as the reign of Futteh Ali Shah, the town furnished 200 men to the regiment known as the Lashkar-i-Arab-o-Ajam. Its decline is attributed entirely to the Turkomans, who, after the death of Nadir, devastated the country, destroying the irrigation works, by which only so large a population could have been maintained. The mounds of numerous kanats, now dry, surround the cultivated area. With the water-supply at the present time available, the crops raised are insufficient for the inhabitants, who import largely from Shahrud and the Gurgan Plain, supplying in exchange salt obtained from the water of the Kal Shor, a briny stream flowing through the plain to the south. The scanty revenue of the "Beluk" of four villages—Jajarm, Gurma, Iver, and Durra, of in all 700 families—is entirely devoted to the maintenance of 100 horsemen for border defence. These are, to a great extent, mounted by the Ilkhani of Bujnurd, who relies on them to hold the passes north of the town. Their number is, however, wholly insufficient, and they are at times compelled to witness helplessly the passage and return of bands of raiders laden with booty and prisoners.

21*st. Iver,* 7 *miles.*—From Jajarm to Shahrud there are two routes; that usually taken by caravans skirts the south of Kuhbaba and crosses a barren waterless plain, passing within a few miles of Maiamai on the main road, and through Bostam; this is the longer but the safest route. The alternative route lies to the north of Kuhbaba, crossing the lower spurs of the main range. It has never, so far as is known, been travelled by any European. Leaving Jajarm with a sufficient escort, I marched to Iver, distant 7 miles, thence to Nardin, said to be 32 miles; the country is uninhabited and constantly traversed by "Alamans." At present the road is comparatively safe, the Yomuts having their attention fully engaged by the Russians and the Persian Governor of Astrabad, who is bidding for their favour. Iver is a small village of 70 or 80 houses, lying in broken grounds on the skirts of the main range.

22*nd. Nardin,* 26 *miles.* — Marched to Nardin, 26 miles,

through barren waterless valleys dividing the spurs of the main range from those of the Kohbaba. The summits of the low hills on either side are formed of a highly crystalline white limestone, the lower slopes of mottled marls and clays; vegetation is almost entirely wanting. The surface of the valleys has a thin covering of varieties of salsola and thorny herbs, and the single spring of water is of a briny saltness.

Nardin, the chief village of the "Beluk" or Chiefship, lies in a small plain surrounded by high mountains to the north rising to a considerable elevation, and with dense forest. To the north-east there is a depression leading to the fertile plateaux of Kalposh, Dasht, and Paighambar Dainel, and thence to the bank of the Gurgan above the gorge, through which it enters the plain. South-east there is a similar depression, through which pass roads to Meges and Gilan on the skirt of the Bostam Plain, and thence to Astrabad and Bostam.

The basin contains one single village, and that a mere mud fort, with a few gardens. The soil is fertile enough, but the supply of water is limited to two scanty springs. No doubt, with a sufficient outlay, the whole basin might be brought under cultivation.

25th. Kanchi, 16 *miles.*—Marched from Tulbin down the valley of Nowdeh to Kanchi, one of four hamlets known collectively as Persian. The village lies in a glen down which flows a sub-tributary stream. It has 150 houses and a good stretch of rice-land up and down the valley. The revenue is paid to the Government of Astrabad through Mirza Allah Yar Khan Sirtip, of the Astrabad Regiment, Governor of the Beluk. The people, though living in a narrow pent-up valley abundantly watered, and growing little but rice, are tall, robust, and healthy-looking, in every respect a finer looking race than the inhabitants of the dry highland glens about Nardin. They are of Turk origin, and speak that language among themselves, though all know Persian. Their fixed revenue is only 25 kharwars = 218 maunds Indian, and valued in cash at 10 to 15 tomans, less than one-tenth of the gross produce. They, however, complained much of illegal exactions. Their position secures their immunity from Turkoman raids, and they know them only by friendly intercourse. From Tulbin the valley falls very rapidly, the mountain slopes on either hand ending abruptly in rugged precipices. The glens and ravines seaming the hill-sides are clothed with juniper to a height of 2000 to 3000 feet, above which is a dense forest of scrub, elm, oak, and maple. The valley is for the most part closely and carefully cultivated, the fields being carefully terraced for irrigation, and fenced with quick-set hedges of

thorn and bramble, or with reed walls and banks. Every untilled spot is covered with a free growth of bramble and scrub, an indication of the proximity of the Caspian and its moisture-laden atmosphere. The rich colours of the hill-sides add much to the attraction of the fine scenery of the valley. Long slopes of brilliant red clay alternate with darker limestones and sandstones, and trap-rocks, of fantastic forms and varied colours, jut out from every spur. Four miles from Tulbin lies the large village of Chinashk, high up on the left of the valley. The main road to Bostam lies through the valley, and beyond, through the village of Tillaver, and over a high pass, is the plain of the Khusbeyeitak Mountains. The Sipan Salar's thirty guns were dragged over this, and later a battery of the Shah's escort. It can, however, have been no easy task, and could hardly be attempted in the face of an active enemy.

26*th*. *To Nowdeh*, 19 *miles*.—From Kanchi a good path winds through the valley to Nowdeh. The defile is open for 10 or 11 miles, and cultivated wherever the windings of the stream leave a level space. A few miles above Nowdeh the hills close in, the banks of the stream rise, and a heavy forest piles the defile, extending up to the crests of the hills and down to the clearings of Nowdeh. The trees are chiefly alder, oak, sycamore, and elm. At Nowdeh the valley expands, and opens into the Gurgan Plain. A low ridge, surmounted by a tomb, lies at the mouth of the valley, and forms a most invaluable watch-tower for the villagers. The plain beyond, for many miles, is covered with scattered patches of forest and dense cane-brakes, through which lead narrow paths to the edge of the open prairie, on which lie the Turkoman "obahs." Nowdeh is a large village, formed of three detached hamlets, in all 200 houses. The level ground in the valley is cleared and closely cultivated, but dense forest encircles the clearing, meeting above and below it, and forming a most effectual barrier, behind which the villagers rest secure from any attack by their neighbours in the plain. They are fine, active men, well armed, and good foresters, and more than a match on their own ground for any number of Turkomans. Their houses are built of cane, plaited into a timber frame, open in front, and without fire-place. The open front is closed at night by a curtain of split cane-work. No better shelter is, they say, necessary, for the winter is short and mild. Snow falls, but lies for at most twenty-four hours. The summer is hot and unhealthy, malarious fever being very prevalent. The village is one of sixty-three villages of the Kohsar Finderisk Beluk, all lying on the flank of the Yomut Turkoman country, but still more free from ravage than the distant villages on the

side of the main range. The forest is, of course, the main source of their safety, but they have also a good organisation for defence. There are fifteen villages in the valley, all near enough to support each other, and communicate either by gunshot or signal-fires. They can collect, in from three to four hours, 1000 men, all armed with serviceable guns, and, to a certain extent, organised, for they are paid a sum sufficient to enable them to keep up their equipment and supply of ammunition, and are accustomed to work together in parties of thirty to forty as guards, escorts, &c.; knowing every path in the forest, and having great confidence in their own power to meet any enemy on their own ground, they would be formidable even to a disciplined force. Nowdeh grows rice and wheat, and a little cotton; of the first, large quantities are exported to Khorassan. The people have a tradition that at some remote period the Caspian covered the plain, running into the valley and forming a small bay, along the shores of which was a forest of date-palms; the villages on either side of the bay used to communicate by boats, and had an extensive trade across the sea. In those times they paid a revenue of 12,000 tomans, the produce of the sale of dates. The mountains were bare of forest, the present dense growth of deciduous trees having spread gradually from the west.* The tradition is very curious, and, coupled with the actual presence of the date-palm at Sari, cannot be easily rejected. The mouth of the Nowdeh Glen is still called the Dihana-i-Khurmalu (*khurma* being Persian for a date-tree), a fact in itself suggestive, though to be accounted for, as it may have its origin in the chance presence of a single specimen. The village pays now a revenue of 200 kharwars of rice, the produce being in favourable years six to eight times that amount. Wheat is more cultivated than formerly, and want of good roads and security alone prevents the increase of the production of cotton.

In the whole range of the Alburz, from Teheran to the Herat River, there is no point at which the chain could be so readily crossed, by either road or railroad, as on the line of the Nowdeh Valley. Up to the village of Tulbin the valley is open enough, and the gradients easy; thence a low easy pass leads to the Nardin Plateau, from whence either Jajarm or Maiamai might be reached without crossing any difficult country. There is no other line offering anything like similar facilities. Coal of good quality has already been found in the mountains to the west.

* My informant also asserted that the Nowdeh stream had in those days a much larger volume, and had been dried up by the growth of the forest on the mountains.

27th. To Ramian, 12 miles.—Marched to Ramian, a large village of 400 houses, 12 miles west from Nowdeh, lying in a glen enclosed by two forest-covered spurs of the Khushyeilak Mountain. The road lies for a mile or two through old clearings, overgrown with cane-brakes and dense thickets of bramble, matted with wild vine and wild hop; beyond and around the clearings is a heavy forest of oak, elm, and beech. The village is a large one, and can turn out from 700 to 800 armed men, including those of the outlying hamlets. As at Nowdeh, the villagers have little to fear from the Turkomans, for a belt of four or five miles of forest and cane-brake effectually protects them; a few head of cattle are at times driven off, and the herdsmen captured; but this is not of frequent occurrence, and there is a good deal of friendly intercourse, buying and selling of horses, and exchange of manufactures. I was assured by the Nayeb, or Governor of the Beluk, that the Yomuts, the "Chumurs," or cultivators, were quite inclined to become peaceable subjects of the Shah, and that the few robberies that occurred were chargeable to a few bad characters, who were well known.

28th. To Katul, 22 miles.—Marched shortly after daybreak, with a strong guard, for Finderisk and Katul. Clearing the glen of Ramian the road lay for some miles through wide clearings, opening on to the plain, on which, a couple of miles distant, but hidden by tall cane-brakes, were the "obahs" of the Yomut "Chumurs." At Finderisk the guard was changed, and a halt of a couple of hours enabled me to see something of the picturesque village, which at a distance looks like a rambling collection of old barns, overgrown with rank tropical vegetation. A closer inspection, however, showed that there was much order and regularity in the disposition of the farms, and an almost Chinese regularity and neatness in ordering the precincts of each little homestead. The centre building is usually of two stories, the whole, to the top of the tiled, or more commonly thatched, roof, not more than 15 to 18 feet. The walls, framed with timber, are formed of neatly-woven cane-work, plastered inside with mud. A wide eave or verandah runs round the four sides, forming a covered and well-protected balcony for winter or wet weather use. A thatch-roofed room, raised 25 to 30 feet from the ground on posts, is used in summer as a sleeping-place by the family. The advantage of sleeping well above the ground in the fever season is fully recognised, and the people, even when working or hunting at a distance from the village, always select some convenient tree, or make a nest raised on poles some distance above the ground: these were visible in all the forest clearings, often like huge

birds' nests. In winter the loft or platform is used as a receptacle for cotton, silk, &c. Flanking the farm-house are usually two or three long barns, with timber posts and walls, of the kind vulgarly known as "wattle-and-daub." Each of these has a paddock, with a neat fence of split cane; the straw-ricks are well raised from the ground on cross-beams, and in a corner of the enclosure stand three or four gigantic barrel-shaped baskets, plastered inside with mud, in which wheat and rice are stored. Each enclosure has its group of orange-trees, also railed in, and a few vines. Leaving Ramian, a ride of 11 miles through mist and heavy rains brought us to Katul.

29*th. Astrabad*, 25 *miles.*—Marched from Katul to Astrabad. The road, lying for the most part through an open plain, within sight of the Yomut "obahs," is considered very dangerous, notwithstanding that the Yomuts are subject, and living, and cultivating within reach of the capital of the province. That the country was really insecure was evident, for the villagers moved about in large parties, well armed, and the ploughmen were at work with their rifles on their backs. The Yomuts are, in fact, masters of the country; their nominal allegiance is gained at the cost of the unfortunate peasantry. Any attempt to coerce them, if made in sufficient force, would be answered by their retirement beyond the Atrak into Russian territory, a course to which the Persian authorities are very loth to drive them. A guard of fifty men, fairly mounted and armed, escorted me to Nowdeh, whence a fresh guard took me to Astrabad. The road lay for the most part through a magnificent park-like plain, extending from the foot of the hills to the Gurgan River, distant 8 to 10 miles. The villages, few and far between, are surrounded by a good stretch of rice and wheat cultivation, and, in place of the mud wall of Khorassan, are defended by wet ditches, backed by tall hedges of thorn and brier; the clusters of thatched cane huts, buried in a luxuriant vegetation, give them a tropical aspect, and there is little, save the fine men and the fine cattle in the farmyards, to distinguish many of them from the forest hamlets of Bengal or the Deccan. After seven or eight successive crops, with a yield of from fifty to seventy fold, a single season's fallow is allowed, and nothing is ever returned to the land in the shape of manure. A good deal of cotton, of a very fine quality, is raised for the Russian market. On approaching the town I was received by a party sent by the Governor to meet me, and conducted to one of the best houses in the town, secured for me by the British Agent. A telegram from the Minister of Foreign Affairs had procured for me a good reception.

Kazi Syud Ahmad, whom I had sent to wait for me, has rejoined me, having improved most zealously the opportunities of gaining information of interest as to the state of the country and people that his stay in the town had given him. Having been taken no notice of by the authorities on his arrival, he was able to communicate more freely with the people than would otherwise have been possible. His knowledge of both the European and the native mode of treatment of the ordinary ailments of the country also opened many doors to him.

The Sahib-i-Ikhtiar, Governor of Astrabad, Suleyman Khan Afshar, visited me in the afternoon. He is an elderly man, who has served the Government in different capacities for many years, and stands high in favour with the Shah. He previously held the government of Kermanshah. Astrabad is considered a most difficult and responsible post.

1st December. Astrabad.—Visited the Russian Consul and the Governor. The former has a good house, with a very fine garden, the property of a Persian, but tenanted for a long time by the Russian Consulate, and altered and improved to suit their taste.

The Governor's residence, or palace, consists of low buildings, with red-tiled roofs, and long, projecting eaves, giving a pagoda-like appearance, surrounding three or four large courts. At the gate of the outer court were displayed the artillery of the province—seven light brass field-guns. The inner court is planted with fine orange-trees, and watered by a small stream, fed by a couple of very feeble fountains, from which flowed muddy streamlets. The Dewankhana and other apartments on one side of the court are large and lofty, and well furnished. The Governor and his son, the Deputy-Governor, received me with much courtesy. The conversation, after discussing the latest European news, turned on the state of the province. The Governor said, I believe with truth, that during his five years' tenure there had been a marked improvement in the security of the roads, and of the villages on the border, and also an increase of trade and population. I should be inclined, however, to attribute the first to the external pressure on the plundering tribes, and the second to the immigration from the famine-stricken districts during the famine. He referred very cautiously to the proceedings of his neighbours on the Caspian, but affirmed that the tract they had occupied, or commenced to occupy, on the Caspian was utterly worthless to them, being incapable of supporting any large population, the tribes across the Atrak being dependent on those on the Persian side for their grain supplies, save in years of very exceptional rainfall.

Canals might do a great deal, but the country rises rapidly a short distance from the river, and would not easily be watered by canals. The mass of the Yomuts, he considered, would become peaceable subjects of Persia, and were already giving up their roving habits. For two years they had not visited in such large numbers as usual their summer-quarters on the Balkhan, and were turning their attention to the Kara Balkhan, or lower ranges between the Atrak and Gurgan, where there was ample pasture.

5th. Kurd Mohalla, 16 *miles.*—Marched to Kurd Mohalla, a large village of fifty to sixty houses in the Beluk of Anazan. The village is the largest in this part of the province; it covers a very great extent of ground, each family having its separate homesteads with barns and paddocks neatly fenced. After entering the village, thirty-five minutes passed in winding through deep narrow lanes, passing stackyards, orchards and farms, to the house provided for my party in its centre. The villagers are a haggard, ill-looking, fever-stricken set, contrasting most unfavourably with the fine-looking population of the forest villages further east. The cause of this difference is to be found probably in difference of position, the western side of the province being more completely shut in between the mountains and the sea, and having probably a heavier rainfall. A short distance from the city the road strikes the old highway of Shah Abbas, and continues along it, or more frequently through the fields skirting it, as far as Kurd Mohalla, which lies ½ mile to the right, and 4 or 5 miles from the seashore. The road or causeway was apparently laid down with great care and labour, being paved throughout with large pebbles from the numerous mountain-streams traversing the forest-covered plain, and drained by deep ditches fenced with a good hedge of white-thorn and wild pomegranate, which is equally thorny and impenetrable; but it was not sufficiently raised, and gaps for cross drainage were neglected. This, with the inevitable Persian indifference to repair, has reduced it to what it is at the present day,—a monument to the wisdom of a single sovereign and a reproach to the neglect and apathy of a long line of successors. The country offers no serious obstacles to the maintenance of a good road, for the cross-drainage streams flow in well-defined deep beds, and the forest and undergrowth have not at all the uncontrollable luxuriance of the tropics. Though not kept clear by traffic, the original clearing is still open. With the material for fascines so close at hand, a small yearly outlay would make a good passable track. A few miles from Astrabad is the picturesque roadside Imamzadah of Roshanabad; Kurd Mohalla has a small fort known as Mulla Killa, 2 miles distant

at the north of the Karasu stream. The villagers have no boats, save the small dug-outs, but the port is frequented by the Turkomans, who bring cargoes of salt and naphtha from Chalaken for the Astrabad market.

6th.—A dense malarious vapour shrouded the scattered homesteads and forest, hiding from view both sea and mountains till midday, when it rose in white clouds under the sun's rays and caught by a slight northerly breeze was wafted away inland, and finally vanished, leaving a line of blue haze still clinging to the forest-clad slopes at the base of the range. The direct road to Nowkanda and Ashraf lies nearly due west along the old road, for the most part through forest or deserted clearings. Traffic follows narrow tracks on the side of the road as far as Nowkanda, where a detour is made to avoid a marshy tract to the right as far as the valley of Gez, whence a path winding through thickets of bramble and thorn, swampy rice-fields, and deep miry forest-land, leads to the large villages of Kasht Tikka, and Gulugah. Gez is an ordinary modern village of 300 to 400 houses, one of the principal in the Anazan Beluk; it owes its notoriety solely to its port, the Bundar-i-Gez, 3½ miles distant, with which it has, however, little connection, there being direct routes to Astrabad and Mazanderan. I was met near Gez by Rahim Khan, of Nowkanda, son of Hamza Khan, Sir A. Burnes' host. Rahim Khan is a young active-looking man. He has charge of the whole Anazan Beluk, which divides Astrabad from Mazanderan, and stretches from the Hazar Jari Beluk beyond the first range of the sea. There are many large villages; Nowkanda, 500 houses; Gez, 300; Sewan, 300; Kasht Tikka, 200; but they are completely buried in forest, in which the cultivated clearings have made little impression. The coast of Anazan and a portion of the east border were till recently exposed to the attacks of the neighbouring Jafar Bai tribe of Turkomans. A force of horse and foot is maintained for the defence of the villages, under the orders of the Khan. From Gez to the port and village of Kinara a narrow track winds through for a couple of miles, and thence across a belt of marshy ground covered with a thick jungle of cane and wild pomegranate, and intersected by numerous fresh-water creeks, with deep treacherous bottoms intervening between the forest and the sand-banks on the shore. Kinara is a miserable-looking village of 100 to 150 cabins—built of waste wood, remnants of old native boats, and the sides of packing-cases, and thatched with rushes—standing in a double line along the beach for 30 or 40 yards from the water's edge. A ruinous-looking jetty runs out about 100 yards into the shallow water, enabling native boats, drawing 2 or 3 feet of water, to discharge their cargoes.

Russian barks trading to Baku and Astrakhan, and other ports on the Caspian, lie off about a mile, and the larger Turkoman boats, "kasaboi," usually send their cargoes either to the jetty or direct to the beach in "naos," or small narrow canoe-shaped "dug-outs." The Russian Vice-Consul, a Nestorian of the Caspian provinces, several Russian Armenian merchants, and a Persian official in charge of the customs and the port, live in the village. About 10 miles north-east of the port is the island of Ashurada, on which are the barracks of the Russian garrison of detachments of two regiments of infantry, and the residence of the Commodore of the East Caspian Squadron and other officials. Three or four small vessels-of-war and a few steam-launches are stationed in the bay to watch the Turkomans and collect the duty levied on their boats. These trade only between their own ports and the village-ports of the Astrabad and Mazanderan coasts and the island of Chalaken, whence they bring cargoes of naphtha and salt. Every boat is bound to show the Russians a pass. This rule is rigorously enforced, and has put an entire stop to the piratical incursions of the Turkomans from which the coast had so long suffered. From Gez there is a path along the beach westward, but it can only be followed with an experienced guide, for the numerous creeks and backwaters abound in quicksands, and the fords are few and unmarked. The path to Nowkanda, Gulugah, and Ashraf lies across a marshy plain covered with dense beds of reeds and cane, and immense tangled masses of bramble. The few clearings are cultivated with rice, and remain more or less under water the whole year. Three or four miles west from Gez a high green rampart of earth runs from the base of the mountains through the forest and over the marshy plain to the shore. It is said to have been raised by Hamza Sultan, an ancestor of the present Khan of Anazan, as a defence against an attack of the Lurs, 250 years ago. The Lurs were defeated with a loss of 20,000 men, and finally driven out of Mazanderan. So stands the tradition; but the Lurs came from the west, and the rampart was obviously made for defence against an enemy coming from the east, for the ditch is to the east, and the *banquette* or path under the crest of the bank to the west. The Turkomans are more likely, therefore, to have been the invaders, but why tradition should confound them with the Lurs is a riddle. A rampart so formed with natural slopes and a broad crest is indestructible; it is possible, therefore, that it is as old as, and had some connection with, Alexander's wall on the opposite shore of the bay. If of no other interest, the rampart gives a very satisfactory proof of the alleged recession of the Caspian. The sea-flank is now at some distance, not less than 300 or 400 yards from the water's edge. Swamps and

cane-brake rendered it unapproachable, but of the fact there was no doubt. The slope of the shore is very gentle, reeds growing out of the water at 100 yards' distance. From Gez to Kasht Tikka, the last village in Astrabad, is a distance of about 6 miles, equal to double the distance on fair ground; for the ride, with a few short stoppages, occupied nearly three hours.

7*th. Ashraf* 16 *miles.*—From Kasht Tikka the road runs west; following the Shah Abbas road, and crossing a small stream which divides the two provinces, passes for a couple of miles through the scattered farms, garden, and orchards of Gulugah. The people could not give a satisfactory reason for their building over so large an extent of ground in a country in which every yard of land has to be reclaimed from a tenacious and ineradicable forest growth, but it is obviously a precaution against fire. The houses are of cane and light woodwork, and are usually surrounded with ricks of hay and straw. The village is a large one, and is said to have a population of 4000 to 5000 souls, which is quite possible, for it covers not less than 2 to 3 square miles. Beyond it the high road, enclosed by a double hedge and in better order, passes through a fine, open, well cultivated country, marshy towards the shore, but firm and dry for several miles from the hill-slopes. The distance from the shore to the cultivated margin (some distance up the hill-slopes) is, at this point, about 8 miles. Forest, except in patches, entirely disappears; the fields are clear, and well fenced and drained, and the villages are more numerous, and have usually a few substantial houses with red-tiled roofs. The crest of a spur overhanging the road at a point where it touches the hill-skirt 6 or 7 miles from Ashraf, commands a fine view of the cultivated plain of Ashraf and the forest of Anazan. To the west, far distant, the Demavend range forms a white wall on the horizon, towards the base of which stretches a grand expanse of rich, cultivated land and green meadows with wide straggling hedge-rows, clusters of thatched-roofed villages, and patches of forest and woodland. To the south, the sea was hidden under a bank of mist. North, the wooded spurs of Alburz fall away in easy undulations to the plain. These lower spurs are little encumbered with the dense forest of the upper ranges. They might at no great cost be cleared, and should, with their rich soil, warm sun, and ample rainfall, supply Persia with all the most valuable products of the subtropical regions of Asia. Tea, coffee, and chinchona would no doubt thrive well, and where the vine grows wild in such luxuriance, vineyards could scarcely fail, in yield and quality of grapes, to rival those of Europe.

Approaching Ashraf the road and the aspect of the country

again improve. The fields are fenced, and have strong wooden gates and stiles. The ground is kept clean and ploughed deep, two pairs of very fine oxen working in relays; the plough also is heavier than that used in other parts. Wheat is grown as frequently as rice; and the cotton was unusually fine, growing to 5 or 6 feet, with heavy pods.

8th. Town of Ashraf.—Halt at Ashraf. The town is now in a far better state than when visited by Fraser and Burnes. It contains from 1200 to 1400 families and 40 to 50 shops. Three or four of the leading merchants have transactions with Constantinople and Astrakhan, exporting cotton, sugar, European goods, cutlery, hardware; importing chiefly iron, iron vessels, crockery, tea-urns, &c. Their port is Mash-had-i-Sar, distant 19 fursakhs, the road passing through Sari and Barfrush. The inhabitants of Ashraf are of mixed race: there are descendants of a Georgian colony brought from the Caucasus by Shah Abbas Seffawi; some families of Talish, a Turk tribe from the coast near Lankeron; Tats, a Persian tribe, and a few houses of Godars, a peculiar race whose origin is very obscure. They are the "Pariah" caste of Mazanderan, having a status and occupation similar to those of the aboriginal tribes of India, the Coles, Bheels and Dares. They are village watchmen, hunters, fishermen, and, though nominally Mussulmans, live mainly on the flesh of wild swine. In summer they wander in the forest when not employed in watching the distant fields. In winter a small thatched cabin on the outskirts of some village shelters them and their families. They rarely marry Persian women, but their women, if pretty are occasionally taken by Persians. From the specimens I saw, there can, I think, be little doubt of their Indian origin. The men are short and dark, but show a good deal of Persian blood. The women, of whom I saw two or three, are short, dark, and slender, with irregular, small features, and little, graceful figures; their costume very much that of Indian women of the lower castes. The children were very dark, and far more slender and spare than the Persians. They appear to have no traditions of their origin, but I was not able to question any but young men of the tribe. They speak the Mazanderani dialect. The Governor of Ashraf is a native, by name Abbas Guli Khan, Sarhang (Colonel), who is also in charge of the irregular troops of the district, and has the customs contract for the ports of Gez and Mash-had-i-Sar. From its situation, Ashraf should be unhealthy; it is enclosed in a hollow of the mountains formed by a projecting spur, on which stands the castle of Seffiabad. Fever, however, is not more prevalent than in other towns of the province. Cholera appears frequently, and is much dreaded. The famous garden of Shah

Abbas is now entirely neglected; the buildings, fountains, and raised stone terraces in ruins. Its natural beauties are, perhaps, unequalled. It is backed by lofty wooded spurs; to the north is a fine view over the blue bay of Ashurada. Several springs rising under the hill-slope flow through it. The cyprus-trees are of gigantic growth, and several of them covered with massive wreaths of wild vine. Orange and citron-trees grow in wild luxuriance; their fruit is left to fall, and literally covers the ground; every house in the town being provided with its own garden or group of orange-trees; there is no market, and it is worth no one's while to export. The old castle of Seffiabad has been replaced by a new building in the European style, with fine rooms. It is decorated outside without taste, in the Persian style, but commands a fine view of the bay and plain. It is already, even before completion, falling to ruin. Though now of little note, Ashraf should some day be the centre of one of the most important agricultural districts of Persia. Everything is there but the energy and capital which, perhaps, can only come from the West.

9th. Ashraf.—Visited the village of Karatuppa, an Afghan colony planted by Nadir Shah on the Gurgan plain, and afterwards removed to its present location. The village is built around the base and on the slope of a mound on the west angle of the bay of Ashurada, seven to eight miles north of Ashraf. It is surrounded by an extensive grassy plain, in part marshy, but generally firm, rich meadow-land. It numbers now 150 houses, all Ghilzai Afghans. The villagers have lost their language and distinctive type, but not the ready hospitality of their countrymen, nor their love of country. Though exceptionally well off, they told me that they look forward to the day that will see their return to their distant mountain-homes. They hold their lands free of revenue, and receive a yearly sum of 400 tomans (not always paid), the pay of 50 horsemen they are bound to keep up armed and equipped for border defence. They trade with the Turkoman coasts, owning six or eight large boats, and have also dealings with the Russians, whom they supply with live-stock, wheat, &c.

I had proposed to visit the new Russian fort on the peninsula of Miankullar, an hour's sail with a fair wind across the west angle of the bay from Karatuppa, but found that a delay of at least another day or two would be necessary. The fort, which is visible from Karatuppa, is a mere outpost, commenced four or five years ago, and lately completed and armed with two light guns. Ashurada is known to be most unsuited for a permanent naval or military station. The water is bad, and extent of ground limited, and liable to be submerged during

northerly gales. The sea rose lately over a great part of the north shore of the island, flooding many of the houses and doing much damage.

The peninsula of Miankullar ("kullur" signifying dry land in the Mazanderahi dialect) is 30 to 40 miles in length, from 3 to 4 miles in breadth, and has ample water, timber, and forage. It is uninhabited and uncultivated. Game is said to abound in the forest, which is preserved as a royal "chase."

10*th. To Nikah,* 16 *miles.*—Marched to the village of Nikah, on the banks of the stream of the same name, which rises in the Shahkuh Mountain, and flows into the sea 12 miles west-north-west of Nikah. The high road from Ashraf is in unusually good order; in place of the rough boulder pavement it is laid down in gravel, and is well raised, drained, and fenced. It has the advantage, however, of running through an open cultivated country and over dry hill-skirts. The Nikah stream is spanned by a fine bridge in perfect order. The village of Nikah, the principal place in that Beluk, has 150 to 200 houses and farms scattered about over the cultivated land on both banks of the river. The people are Geraili Turks, of which tribe there are six other villages in the Beluk. A large village, Nowzarabad, lies at the mouth of the stream, but there is no port, the nearest being Mash-had-i-Sar, further west on the Babil stream. East of the head of the Miankullar peninsula the forest commences again, and extends along the coast as far as the eye can reach. It is broken only by clearings. The bare marshy plains of Ashraf were probably, till very lately, covered by the shallow waters of the bay, the deposits of salt from which prevent the growth of the usual luxuriant vegetation of the coast. The shore for many miles is flat, and is submerged for some distance inland during northerly gales. The water of Karatuppa and of other villages on the plain is brackish, and most of the vegetation indicates a saline soil.

The mountain-slopes to the right of the high road are to some extent cleared of forest and cultivated. This I found was a result of the American war and the famine, by which the demand for cotton and wheat was greatly increased. The price of cotton at that time rose to 40 tomans per kharwar of 40 Tabriz maunds, the normal price being 7 to 8. Production still pays and is increasing.

The Mazanderan peasant is a proprietor, and owns his land absolutely. He is only restricted by custom from sale. Even the forest lands, which are "common," are inalienable. Such a tenure, though a great incentive to individual exertions, is an obstacle to development of the resources of the country. An ignorant and poor peasantry, without capital, and an

apathetic and feeble government, can never raise the country above its present level, while the difficulty or impossibility of acquiring land would bar Western enterprise and capital.

Mazanderan, the province of Persia, with the greatest natural resources and most industrious population, and the most perfect security, pays, I was told, barely 40,000 tomans=16,000*l.* into the royal treasury.

11*th.* *To Sari,* 18 *miles.*—Marched from Nikah to Sari, the principal town of the province and the seat of Government. After crossing the Nikah stream, the high road, which is in remarkably good order, and has the appearance in places of a wide, well-kept, well-edged English metalled road, turns south, and clinging to the hill-skirts, bends in a wide curve west to the banks of the Tajan River. The country on either hand is open and well cultivated; the fields small, with wide hedgerows of white thorns, gates, and stiles. A good deal of labour is evidently expended on the land, but it is, nevertheless, usually dirty. The small, light plough of the country fails to eradicate weeds and undergrowth. A clear field is only to be seen near the homesteads in the distant and newly-cleared lands. One year's fallow produces a dense growth of thorn and weeds, that can only be got rid of by fire. To the right of the road low forest-covered hills stretch away east and south for 50 or 60 miles, gradually rising to the high ridge running from Demavend to Shah-kuh, which shows a continuous line of snow-peaks. To the left, five to six or eight miles distant, is the forest extending from the peninsula of Mian-kullar into the Sari district. The Tajan is a fine stream, flowing over a sound gravelly bed 200 to 250 yards wide. It was full, but not flooded, and fordable everywhere. It rises in the mountains west of Shah-koh, draining the Hazar Jureeb plateau, enters the plain of Sari 4 to 5 miles above the town, and 16 to 17 miles from the sea. At its mouth is the village of Farababad, formerly a large town, now a small port frequented only by native trading-boats. In the estuary is one of the principal sturgeon fisheries on the coast, farmed with the other fisheries of the province to a Russian company for the annual sum of 68,000 tomans.

Crossing the Tajan by a well-built stone-bridge of 17 arches, a neatly-laid paved causeway leads to the town of Sari.

12*th.*—Sari is now a flourishing town, in a state very different from that described by Fraser. Externally there is probably little change, its defences consisting still of a ditch with a low rampart of easy slope, and cut down by traffic in many places. Originally it must have been sufficiently protected, for the ditch is still in places wide and deep, and the rampart of imposing profile, with some sort of provision for flanking fire in the shape

of short irregular bastions and salients. Even from the crest of the parapet hardly anything is to be seen of the town, the low houses being buried in masses of orange-trees. There are four gates, the Barfrush, Astrabad, Farababad, and Chil Dukhtaram. The second only is in good repair, having a guard-house with two towers roofed with tiles, in a style similar to that represented in drawings of Chinese or Thibetan towns. Within the town there is an appearance of neatness, order, activity, and prosperity quite unusual in Persia. The houses are for the most part well-built, clean, and spacious, each having its yard and group of orange-trees. The streets are well paved, drained, and provided with raised footpaths on either side. There are exceptionally bad places, but they are exceptional, and not the rule, as in all other towns. The bazaars are covered and kept clean, and the shops well-stocked. The market-place is a sight worth seeing in the East. It would lose little by comparison with the "Kermess" of Quimper or Pau; less order and cleanliness, few women, no gardeners, and red-breeched slouching conscripts, but an ample display of country produce and cheap foreign wares set out in tempting array. The stalls were for the most part covered with clean white tents, and the vendors silent and businesslike, and not inactive. The fruit and butchers' stalls were particularly well provided. The town has no special industry, but almost all the wants of the country are provided for; a rough white cloth, known as "kattan," and silk stuffs are woven, and a good deal done in leather work. The mosques are neat and picturesque, with coved red-tiled roofs, carved wooden pillars and joists, squares of green turf, and lines of orange-trees. Repair and paving of streets was, I found, in the hands of the "Kelanters," or headmen of the six quarters or mohullas, a sort of municipal committee, receiving little aid from the Governor, and dependent on the town for funds. Of the population of 15,000 to 16,000 a large proportion are only winter visitors, driven in from the mountain-pastures and the villages near the summit of the range. A large number of Firoz Kuhis come down to work in the farms, brickyards, and bazaars during winter. They are easily distinguished by their ruddy, healthy colours, from the sallow, haggard citizens and peasants of the marshy, forest-covered plain.

The trade of Sari has much increased of late years, cotton and wheat being exported in exchange for European goods. Silk, formerly a great staple, has declined, I was credibly informed, as a result of trafficking with the infidels at Astrakhan, to which port large quantity of eggs used to be sent. Much of the goods displayed was from Western Europe; English piece-

goods, French sugar, and German chinaware and broadcloth. The Russians have a good hold on the market, but not a monopoly. With better roads across the mountains, English goods from Ispahan should supply more than a fair share of the market. The reputation of our goods is unrivalled, but their price is comparatively too high.

The population of Sari is of mixed origin: the Zaths, or Persians, probably predominate, Turks, Kurds, and some few hundred Bungashio, Afghans, and Turkomans making up the list. The Governor, Mirza Masih Moiz-u-Dowla, is a native; his authority extends directly only over the eastern parts of the province; he has also a nominal authority over the coast or maritime tribe of Turkomans, the principal of which is the Ogurjily, a branch of the Jafar Bai. Beyond the exception of a light tax on trading-boats, they are not interfered with.

13*th. Seid Mohalla*, 13 *miles.*—Marched from Sari to Seid Mohalla over a bad village-track winding through wet fields and marshy forest, the main or Shah Abbas road being reported to be impassable.

Before leaving Sari received a visit from some Turkomans of the Ogurjily Jafar Bai tribe, living at Hassan Guli, on the north bank of the Atrak, 8 miles from Chikishliar (a point occupied by the Russians at the time of advance on Khiva, and now abandoned), and thence Russian subjects. The Ogurjily neither cultivate nor rear cattle. They are traders and sailors, and thus tied to the sea. With a violent objection to becoming Russian subjects, they appear to object still more strongly to removing to the damp, hot, unhealthy country bordering the sea south of the Atrak.

14*th. To Barfrush*, 12 *miles.*—Marched to Barfrush, 12 miles, across a very wet, swampy country, with a few scattered homesteads, and some rice-cultivation in forest-clearings.

Barfrush is the commercial capital of Mazanderan. It has not regained the losses in population suffered during the plague in 1832, but it is still a large town, and its trade must have very much increased within the last few years.

The town is open, and the houses much scattered and concealed by masses of orange and other dark-foliaged evergreens. From the east it is approached across a fine expanse of meadowland. The houses are low, neatly whitewashed or painted, with deep-covered red-tile roofs. Each has a small court, enclosed by a high mud-wall, coped either with tiles or a line of gilliflowers, the broad leaves of which act as a thatch. The streets are narrow but clean, and well paved, and the shops and bazaars well built, and full of European goods, both English and Russian. There are said to be 12,000 houses, which would give a

population of 50,000 to 60,000, and this is, I daresay, not far over the mark. Beyond the bazaars the houses are so much scattered that it would be difficult to form any idea of the size of the town, but it covers a large extent of ground, and the commercial parts are much crowded. Five thousand tomans is the revenue now taken from the town, raised principally by a tax on trades, the whole sum being distributed over the different guilds, whose representative is the Collector. No octroi is levied.

The port of Mash-had-i-Sar, 8 miles distant, is said to be frequented by numbers of Russian ships, which monopolise the trade with the Caspian ports; native craft trade only with the Turkomans and the Island of Cheleken. A mail-steamer calls every seventh day, and takes up passengers and light cargo for Baku and Astrakhan. In spite of this connecting link with the civilised world, it is as ill provided with news, and as indifferent to it, as are other parts of Persia. The Russians have a Vice-Consul (a native of Shiraz) at Barfrush to look after the interests of their merchants, a few of whom reside in the place. The staple exports from Barfrush and the district are dried fruits, which are brought from across the mountains, cotton, silk and rice, chiefly raised in the district. The returns are in cloth, goods of various kinds, hardware, and glass. Sugar-cane of an inferior quality and hemp are also grown in the district, but are not exported.

Between the town and the Babil River is a royal garden on an island in the centre of a small lake, filled by the overflowings from the river at certain seasons. There are remains of a channel by which a constant supply was kept up, but this is now choked up and useless. The garden and buildings are in the usual neglected condition, but there is a fine view of the peak of Demavend, the lower ranges, and the well-wooded plain.

15*th. To Amol,* 20 *miles.*—Marched to Amol, 20 miles south-west of Barfrush. The Babil River, one mile from the town, is crossed by a fine stone bridge built by Mahomed Hassan Khan, a former Governor. The stream is deep, with a slow current and treacherous bottom. A few hundred yards above the bridge is the junction of the Babil and Kari, a stream flowing from the mountains south-west. Between the Babil and Amol a great extent of country is cultivated with rice, and irrigated by numerous cuts from the Haraz River. There are also wide stretches of scrub-jungle, thorny and impenetrable. A more difficult country over which to move either horse, foot, or guns, it would be difficult to find, for even the tilled portion is fenced with wide straggling hedges and deep dykes.

The town of Amol is opened and screened from view on approach by dense groves of orange-trees. It lies on both banks of the Haraz, a fine stream flowing rapidly and noisily over a gravel-bed. It is spanned by a solid stone bridge of twelve arches, built by the townspeople, which is probably in this respect unique. Before the great plague the town was a place of some importance, and had a population, it is said, of 50,000. To some extent it has recovered, but it lacks the stimulus given by an increasing and active trade with the Russian coasts enjoyed by the towns nearer the ports of Mashhad-i-Sar and Gez. Its population is now not more than from 4000 to 5000 souls.

16*th. To Parush*, 19 *miles*.—From Amol the road to Teheran lies due south up the valley of the Haraz. Near the foot of the hills rice-cultivation ceases, and the plain and hill-skirts are covered with heavy forest. The lower portions of the forest still retained their foliage with the tints of autumn, while higher up the trees were bare. Large quantities of mistletoe are cut and carried to the villages from these forests, and used as winter food for cattle. In the gorge of the Haraz is the commencement of a new road, constructed on the European plan, and intended to be made practicable for wheeled traffic between Mazanderan and the capital. The forest has been cleared, and some labour expended in blasting and cutting; but the building is very inferior, and cannot last more than a season or two. There are several large wells already showing extensive gaps, owing to defective foundation, and two bridges have been carried away, the masonry exposed being of the worst possible description. The width of the road and the gradients are very irregular, but it is, nevertheless, a vast improvement on the old dangerous track, and if completed and kept open will prove an immense boon to the country. Parash is a mere roadside station, having for public accommodation a number of caves cut in the face of a gravel-bank near the river. A private house, belonging to the Governor of Larijan, is available for travellers. There is little cultivation in the lower part of the valley, and no villages, the nearest being in the Chilah Glen, where there are six outlying villages of the district of Sari.

17*th. To Baijan*, 23 *miles*.—From Parash the road follows up the course of the Haraz to Baijan, a small village, distant 23 miles. The valley is enclosed by high spurs from the lofty ridges of the main chain, the lower slopes generally precipitous and inaccessible. The forest extends for 4 or 5 miles along the upper slopes, and gradually ceases, giving place to scattered groups of juniper. The new road is, for the most part, incomplete, but so far presents no serious difficulties; with a little

labour and care there is nothing to prevent its being kept open at all seasons. Two of the new bridges appear to be well built and substantial, but they span only the minimum volume, the flood being intended to find its way round on either side. At Kullubund, half-way, is the headquarters of the Persian sappers employed on the road. In place of tents the caves cut in a gravel-bank and used as caravanserais were allotted to them, and made very comfortable winter-quarters. These banks of gravel are the characteristic feature of the Haraz Valley. They vary from 10 to 50, and even 100 feet in height, and fill every angle of the stream, seeming to mark its former level. They are formed of gravel of all sizes; in parts water-worn, the deposit of the numberless mountain-torrents, and in parts angular, the collection of centuries of disintegration of the precipitous slopes bounding the river by the action of frost, snow, and rain. Many of the banks are now above the highest flood-level of the stream, and consequently permanent. In these long lines of caves have been excavated. There are four such stations, and it is calculated that they shelter no less than 400 or 500 mules, with numerous travellers every night.

18*th*. *To Rahna.*—Above Baijan the valley narrows, the mountain-slopes close in and become more precipitous, till at a distance, ·2 to 2½ miles, they form the defile known as the Mullik Bund, which passes for half-a-mile between walls of rock, rising to 200 and 300 feet perpendicular height, and divided by a space of 15 to 20 yards only at the narrowest point. The new road is being cut sheer into the face of the cliff, and the Persian engineers have taken their task boldly in hand, and will apparently make a creditable work of it. There are traces at the narrowest point of an old road and two old bridges, very curious relics. The road was carried along the face of the cliff, which is like a wall without any cutting. In places it is built up from the bed of the stream, in others on what must have been shaky foundations afforded by chance ledges. On reaching an angle it was found apparently impossible to turn it, and there being a convenient ledge of a few feet, a bridge of one span was thrown across the chasm, at a height of 80 feet above the stream; the portion of the arch still clinging to the face of the cliff shows that it had a width of not more than 3 feet, with the form of a half-moon. As a monument of primitive and yet ingenious engineering, it is to be regretted that it has not remained intact. The road can never have been wide enough to give passage to a laden mule. They were probably, as at the present day on the existing road, unladen, and the loads carried over by hand. Preparations are being made for a rock-carving in the ancient Persian style, which is to commemorate

the opening of the road. From what I saw, I think it probable that the artist will have ample time to complete the Shah's sculpture and an inscription of any length he wishes. The road was intended to be open for the Shah's visit to Mazanderan in the spring; but this is absolutely impossible.

Above the defile the valley opens out, and there are several large villages in the glens opening into it. These are now for the most part deserted, the inhabitants having left for their winter-farms in Mazanderan. There are a certain proportion of permanent residents who cultivate the scanty corn-lands fringing the base of the precipitous ridges, which rise on all sides to a great elevation. The district, which is known as Tanjan, is said to contain 40,000 families, of which three-fourths migrate every winter, having their lands on the Plain of Amol.

On clearing the Mullik Bund Pass, the Peak of Demavend first appears, towering above the valley and dwarfing the high peaks around it. High up in a glen, on its eastern slope, is the village of Garm-ah, where are some hot springs, much used by the natives for almost every bodily ailment from which they suffer. The stones in the bed of the small stream, fed by the spring, are covered with a thick deposit of sulphur, with which the water is highly impregnated. The springs have been resorted to by members of the European Missions at Teheran, and found highly efficacious in certain cases. There is a bath and indifferent accommodation in the village, but unlimited ground for tents. No better place could be selected as the base of operations for an ascent of the peak. Rahna is a large village of 200 houses, lying 1000 to 1200 feet above the Haraz. The new road passes through it, reaching it by a succession of zigzags, rising 1000 feet in a distance of about 1 mile.

20th. To Ah.—From Rahna the road descends again to the level of the river, passing the village of Ask, the principal one of the district, numbering nearly 500 houses. In winter it is almost entirely deserted. The new road beyond this point has almost arrived at completion, according to the standard up to which the Engineers are working; but there still is a great deal to be done to make it a permanent and reliable highway. Drainage has been entirely neglected, and the loose slopes of volcanic rocks at the base of Damavend are everywhere unrevetted, and will be a source of constant trouble. About 20 miles from Ask the road crosses and finally leaves the valley of the Haraz, and, ascending a lateral glen, crosses the highest point on the road, the Pass of Imamzada Hashim, about 7500 feet above sea-level. Four miles from the crest of the pass is the Lake of Demavend, a large, deep mountain-torrent fed by springs, about which wonderful stories were told

me. I have no doubt that it would repay scientific survey, with the view of utilising its waters for the irrigation of the plain below Demavend. Ah is a large village at the head of the Rudihind stream. In spring or summer it may deserve its reputation for its beauty and the luxuriance of its vegetation, but looks in winter, with its snow-covered hills and lines of bare willows and poplars, desolate enough. I was hospitably entertained and lodged in a very handsome room by a Haji, who had travelled to Constantinople, Bombay, and Calcutta, and returned only to assert that, for wealth and magnificence, there was no city in the world like Teheran!

21*st.* *To Teheran.*—From Ah a good bridle-path leads downstream past the villages of Rudihind and Bumahan, where it crosses a small stream by a dilapidated stone bridge. The direct road from Demavend to Teheran is met at this point, 5 miles, from Ah, thence a ride of 25 miles brought us to Teheran.

Notes on the Topography of the Eastern Alburz Tract, with notices on a few places of interest on the Persian border.—From the latitude of Astrabad the Alburz Mountains continue in a serried, unbroken line, eastward, for about 100 miles to the point where the Nowdeh Valley cuts deep into the chain. Thence they spread out, forming a broad expanse of hilly country, extending north to the banks of the main branch of the Atrak, and east for 70 miles.

To the west, this tract is supported by the Kuh Zirkay, which abuts on the Gurgan Plain. A line of heights, connected by low ridges, divide it from the Jajarm Plain on the south. It is traversed, from east to west, by numerous plateaux, more or less level, forming the Gurgan drainage-basin, but draining also south to the desert, and north into the Atrak. Beyond the Kuh Zirkay the range loses its covering of forest, and the hill-slopes become bare and rugged; but the plateaux are for the most part fertile, well watered, and capable of supporting a considerable population. Nardin, the most western, has a small population; but those to the east, the plateaux of Kalposh and Dasht, draining to the Gurghan; Murtaza Ali Maidan, Shaoghan, to the south; Simalghan, to the north and south, are completely desolate, and form, between Kurd and Turkoman, a neutral ground, of which neither race is able to retain possession. From the Shaoghan and Simalghan plateaux rises the Aladagh, a high mass of mountain, which, together with the

Kuh Salig to the south-east, of about the same height and greater extent, drops its northern spurs into the plain of Bujnurd, and its southern spurs into the Jajarm or Isferayin Plain.

East from Aladagh and Salig the range extends in a high, unbroken line, falling abruptly into the plain of Isferayin, and with easy undulations into that of Koochan. Mirzakhana and Shahjehan, the two highest peaks, reach an absolute elevation of about 8000 feet, while above the plains north and south they rise 5000 feet and 4000 feet respectively.

East of Shahjehan the range bends south-east, and is broken by the plateaux of Sultan Maidan, Bam, and Seffiabad. Rising from there it forms a high mass, known as the Kuh-i-Mirabad, dividing the districts of Nishabur and Mash-had, falls again at Sherifabad, where the lower Mash-had road crosses it, and continues, south-east, about 180 miles further to Bakharz, where it attains again a considerable elevation, and thence on in a broken line nearly to Sahhed on the Herat and Furrah road. This chain may be said to form the southern chain of the East Alburz.

The northern chain is connected with it by an open elevated tract, dividing the Mash-had or Heri road basin from that of Koochan or the Atrak. A line of peaks stretch from a point 30 to 40 miles north of Bujnurd, along the "Atak," and thence, south-east, towards Kelat, supporting to the south an elevated expanse of downs, of easy slope and cultivable, reaching to the valley of Koochan and Shirwan; to the north, falling with a steep slope to the Atak, and throwing out, north-west, a line of heights, extending for about 100 miles into the desert, in low ridges and sandhills, but falling just short of junction with the Balkhan ridge, and the elevated pastures on the shore of that bay. Eastward extend several long rugged spurs, the most northern one overhanging the "Atak," as far as Darehgaz, to the south of which it falls into the plain; a second, running north of Darehgaz, into the plain between Darehgaz and Abiverd, across which lies the pass of Allaho Akbar; a third, a low ridge, connecting with the Kelat range.

In the north-east slopes of this line of peaks rises Darehgaz stream, flowing to the Atak; in the south-west the different tributary streams of the Atrak, enclosed by spurs, extending far into the Atrak-Gurgan Plain.

East of the Allah-ho Akbar Pass the Kelat range extends, south-east, for about 180 miles to the Heri road, falling north into the Atak, south into the plain of Mash-had. It has a uniform width of about 45 to 50 miles, and is exceedingly

rugged in outline, the spurs running into the "Atak" being more precipitous and inaccessible than any other part of the whole range. The principal elevations, the Kuh Imarat, Kuh Tammas, Karadagh, and Takakhana, the last, eastwards, have a nearly uniform elevation of about 7500 feet above sea-level.

The drainage of the East Alburz passes almost entirely to the west and north. South, the wide plain of Jouvain and Isferayin (which is divided only by a single narrow ridge), with a width of 30 to 40 miles, and a length, from the border of Nishabur to Raibat, west of Jajarm, of about 130 miles, is drained by a single narrow and shallow channel, known as the Kal-i-Shor, which flows under the Pul-i-Abrishm. The surface of the plain is level and the soil fertile; but from lack of water it appears sterile, and is little cultivated.

The Mash-had Plain has a width varying from 15 to 20 and 30 miles, and is surrounded by high mountains; but, nevertheless, its drainage feeds but one small stream, the Kashaf Rud, which, rising in an extensive marsh near the village of Radkan, flows for 50 miles to Mash-had, and thence 80 miles to the Pul-i-Khatun. Except in heavy flood, it is everywhere fordable. The few small streams flowing from the mountains are lost in the irrigation channels of the wide valley.

The perennial source of the Gurgan lies below the defile known as the Dihana-i-Gurgan, 30 miles N.W.W. of Jajarm, but a large tract of hilly country is included in its basin.

The plateau of Kalposh, high, well-wooded, watered, and fertile; the plateau of Dasht, low-lying and barren, but capable of cultivation, to the south, the Chandi Abbas Plateau to the east, the Nardin Basin and slopes of Kuh Zirkay to the south-west drain into it, sending in spring a torrent through the Gurgan defile. Below this defile (Route 16) the Gurgan stream rises, and winds for 18 to 20 miles between enclosing hills to Gurgan, where the spur enclosing it on the right disappears in the plain, which opens to the west and north. On its banks are said to be fine woods and pastures.

Gurgan is described as an "olang," or meadow, wide and open, extending to the mountains on the one hand, and to the Gurgan stream on the other. It has permanent camps, or settlements of the Goklan tribe, with cultivation and plantations of mulberry. The valley above is not occupied, having been much exposed to raids of the Akhal Turkomans from Karakalla, whence there is a good bridle-road from north-east, across the broken, mountainous country intervening between the Atrak tributary streams.

Below Gurgan, the Gurgan stream receives its last tributary brook from the north; but the hills bounding in that direction extend for some distance further in broken undulations, and deep ravines furrow the slopes to the banks of the stream.

On the south bank the surface of the valley appears less broken. The stream is distant some 16 to 18 miles from the base of the mountains, which are covered with dense forest, a belt of which, gradually widening to the west, intervenes between them and the plain. Thence, to within a few miles of the sea, the stream flows in a deep bed, the valley widening out to the south and merging north into the Atrak Plain. From the south it receives some trifling contributions from Kalposh Ridge, the streams Kerawul and Sangar, and the drainage of the Kohsar Plateau, a high block of undulating table-land, supported at a height of 1000 to 1500 feet above the plain by the southern spurs of Kuh Zirkay.

The plateau has a length of about 30 miles, with a width of 10 to 12. It has ample wood and water, and a most fertile soil, supporting without irrigation a population said to number 7000 families. The largest villages, Dezain, Farang, Pursyan, have 1000 houses each.

It is protected on all sides by precipitous heights from the Turkomans in the plain below. Two deep valleys drain it, one running from Pursyan, in which flows the Tara stream, the other known as the Hajitar "Durra," or glen, from a tribe of that name located there; a third small stream falls into the Nowdeh stream at Kanchi (Route 17).

Though of small extent, the plateau has many special points of interest, suspended, as it is, midway between the fine plain of Gurgan and the main range of Alburz, rising to 8000 feet; its climate and scenery are magnificent. Its population bears perhaps a larger ratio to area than any other rural community in Persia, and living, as they do, within sight of the Yomuts' "obahs," the villagers enjoy the most perfect security and tranquillity; while their fellow-subjects in Khorassan, protected by 200 miles of waterless desert, are daily carried off into slavery. As a cantonment for any force of European troops (or even of Persian troops, for unless natives, they suffer severely from the climate of Astrabad) holding the Gurgan-Atrak Plain, no better spot is to be found on the whole range.

From Gurgan to the Gunbuz-i-Kaus, between the mountains and the stream, the plain is occupied by the Goklans, some 5000 or 6000 tents. Thence along both banks of the sea the Yomut "Chumurs," or settlers, are in possession. The Nowdeh stream

draining the valley joins the Gurgan, west of the Gunbuz, much diminished by irrigation-cuts by the way.

From the point where the streams leave the hills, the Persian border in the plain may be said to begin, for the Goklan and the Hajilar tribe are only nominally tributary. Thence a wide belt of forest and cane-brake, with scattered villages and clearing, extends along the base of the mountains as far as Astrabad. The edge of the forest everywhere marks the border; beyond, the open plain is in undisputed possession of the Yomuts. The villages in this forest tract are large and populous, the two beluks, or districts, Findarisk and Katul, into which it is divided, having, it is estimated, together with Kohsar, 100 villages and 20,000 houses. Of late years cultivation has much extended, owing to a rise in the price of wheat and the increased demand for cotton; and the forest has been cleared in parts up to the base of the hills. The present generation of Turkomans is also said to be more addicted to tilling the land than their ancestors, and more inclined to settle. The "Chumurs" moving their camps but rarely and in a limited circle. These and other causes have much altered the face of the valley, and must continue to do so. Before many years are past, if even the present measure of good government and security continue, the trackless forest and collections of reed huts of a population in a chronic state of panic will have given place to a cultivated plain, combining the scenery of a well-wooded English country with the climate of Southern Italy, and studded with red-roofed villages, standing out boldly amongst orchards and gardens. As it nears the sea the banks of the Gurgan fall, and its current becomes sluggish. It is said to be fordable everywhere except after floods. It reaches the sea by two mouths through a barren flat, on which are camps of the Ogurjhily, the trading-tribe of Yomuts.

The largest tributary (or main stream) of the Atrak, the Germekhans, drains the plateaux lying north and east of Koochan, the western slopes of the Kelat chain, the Koochan Plain, and the mountains bounding it on the south; an area of about 2000 square miles, forming the upper part of the drainage-basin. Passing south of Koochan, it receives the waters of a large spring known as the Kara Kazan, the reputed source, also a small stream from the north of Shirwan. At 45 to 50 miles from Kill Yusuf Khan, the point at which it enters the Koochan Plain, it disappears in a narrow gorge, known as the Tung-i-Rezabad, and continues to flow thence between high mountains W.N.W. and W. for about 40 miles to Mana, a large village, 20 miles N.W. from Bujnurd by road, receiving small streams

from the Bujnurd, and the mountains forming the watershed, 15 to 20 miles distant, to the south; from the north the drainage of Kushkhana Plateau, 30 to 40 miles north-east.

From Mana, about 80 miles, to the Chat-i-Atrak, the point of junction of the Chandir stream from the north, the Germekhans flows through a country of low hills and plateau seamed with ravines. The spur or ridge of the "Atak" chain bounding it to the north rises high, and is difficult to cross; that to the south is easy.

The direct road to Mana from Shirwan is said to be very bad, and probably is so, for the gorge is narrow and winding.

From the south, from Minabad or Isferayin, two roads pass depressions in the ridge of the Kuh Salig, and crossing the Bujnurd Plain, reach the valley of Germekhans. (Routes 14, 15.)

From Sanghas two roads skirt the Kuh Buhar: one to the west, across the Shaoghan Plain, and west of Kuh Korkhud to the Su Germekhans, and thence to Peshkala (Route 14), a good bridle-road, crossing only one low ridge; the other to the west, crossing two ridges and passing Chalbash Karat to Chihl Guzr (Route 18), said to be more difficult.

From Nardin there is one road said to be passable for guns down the "Atak," and in all respects the best.

From Chihl Guzr a road follows the stream westward to the plain, and one from Gurgan to Kara Killa traverses the valley. This was the road most used by the Tekkeh in their raids south, when they had possession of Kara Killa.

In addition to these beaten tracks, there are innumerable footpaths and bridle-paths traversing the valley, which is, in fact, accessible to the active horsemen of the country at all points. Below Mana the valley opens slightly; the hills enclosing it are bare or scantily clothed with scrub and juniper, but the windings of the stream enclose many rich and fertile pastures, which at the "Chat" widen out into broad green prairies, unoccupied and unvisited, save by occasional passing "Alamans."

The Chandir drains the western spurs of Kuh Giffan, a high peak bearing about north-west from Shirwan, and from Charikolang flows west. It is traversed by three roads, given in Routes 14, 15, 18, and by the road leading from Gurgan to Kara Killa. After passing for about 70 miles through a rough hilly tract it receives from the north the Ab-i-Sunt, a sub-tributary, draining the most northern spur of the Atak chain. The junction is known as the Chat-i-Chandir. Thence bending south it joins the Atrak at the Chat-i-Atrak.

The Ab-i-Sunt drains the long high spur of the Atak chain, which forms the boundary wall of the "Atak," and runs north-west

past Kizil Arvat into the desert. To its north lies the "Dasht," a wide plateau, divided from the river by low ridges, and rising in a gradual slope up to the main ridge. North-west and east the enclosing mountains rise to a considerable height. At the edge of the "Dasht," on the spur of the mountain known as the Sunting Sur, or Sunt Sur, stands the fort of the Kara Killa. Its position commanding (as it does) the only good road on to the Dasht Plateau and then to the "Atak," it has been the scene of frequent struggles between the Turkomans and Shahdilu Kurds. Some four years ago the Saham-u-daula, Ilkhanni, or Chief of the Shahdilu, led a small force with a few guns against it, and succeeded in capturing it after a siege of some days, and two unsuccessful assaults. The current account of the affair is probably exaggerated as to the heavy losses sustained; but there is no doubt that the Turkomans, having their wives and families with them, fought hard. They numbered 300 or 400, and but few of them escaped.

The fact that the light guns taken with the force were able to break the walls of the fort is worthy of note, as showing that it cannot be very formidable either in position or construction. The Persian force returned after plundering the nearest "obahs," and the fort remained unoccupied. After the fall of Khiva, a body of Goklans, said to number 200 families, fugitives from thence, with the assent of the Ilkhani, took possession of, and repaired the fort. They did not, however, obtain undisputed possession, for the Akhal Tekkeh, who had opposed their passage of the desert, attacked them frequently, and there is said to have been some hard fighting. The Goklan still remained in possession, and are nominally tributary to the Ilkhani, and to Persia—a rumour that they have leagued with the Akhal, and thus given offence to Russia, who still regards them as her subjects, and only awaits an opportunity to coerce them, though possibly without foundation, invests the little garrison with an interest to which it would otherwise have no claim. From the fort to the Chat-i-Chandir, the point at which a force attacking from that direction would enter the hills, is a distance of about 8 fursakhs. The road, with the exception of the last 2 fursakhs, is said to be not difficult, but the spurs of the Sung Dagh, a ridge lying north of the Chat, and running south-west, close in on the stream, and must form a difficult defile. The road from Kizil Arvat to Kara Killa (Route 14) is said to be passable for guns; but a force, if coming from the Atrak, seeking to attack from that side, must march for some days across a barren, waterless tract to turn the Atak range. Infantry marching from Balkhan to Kizil Arvat would

be dependent on the supply of water they could carry with them, at least between the three points where water is found.

From the Chat-i-Atrak, the point of junction of all the principal tributary streams of the Atrak, to the sea the river has a course of about 80 miles, bending towards the south, and away from the outer range. The fertile plain between it and the Gurgan lies on one side, varying in width from 12 to 7 fursakhs on the other, and stretching away far to the north, a wide expanse of barren desert.

The banks of the Atrak are said to have none of the surpassing fertility of the Gurgan Plain. There are pastures and patches of cultivation, watered by canals from the Atrak, but not the spontaneous and luxuriant vegetation of the tract further south. The ruins of large cities testify, however, to the fact that the northern plain in former times supported a large population. The existing canals from the river are shared by the Jafar Bai and Ata Bai clans of Yomuts. The former are in parts Russian subjects, the latter nominally Persian.

The Atrak flows into the Caspian at the head of a deep indentation, forming a bay or estuary known as Hasan Kuli. The shores of the bay are flat, sandy, and barren. On the north shore, near the river, is the Ogurjhily Yomut settlement of Hasan Kuli, and 2 fursakhs further down the fort of Chikishliar, the base of operations of Markosoff's column when acting in the direction of Khiva, and at one time held permanently by the Russians, but now abandoned.

Some miles above Hasan Kuli the plain becomes covered with fine pastures, which extend for 2 or 3 fursakhs up the stream. These are known as the "Atrak," and are always designated by that name, and not the river, unless it be specially mentioned.

From 100 to 150 miles north of the estuary lies the tract of country known to the Turkomans as Balkan. It is described as an elevated steppe, with rocky heights reaching to the shores of the Caspian, and long slopes to the south and east, merging into the general level of the desert. There are many fine pastures and springs. The snow, which covers the mountains and higher slopes in winter, melting in spring leaves numerous pools, around which the Yomut nomads from the Gurgan pitch their summer-camps.

On the bay of Balkan is the Russian settlement called by them Krasnovodsk, and known to the Yomuts as Kizil Su, and to the more distant tribes, the Akhal and Merv Tekkeh, as Shah Kadam, or Mullakari. It is the only spot yet permanently occupied by them on the south-east coast of the Caspian.

Krasnovodsk, or Kizil Su, is marked on our maps on the north shore of Balkan Bay; but the Turkomans place it on the south shore at the bottom of a little bay, known as Kizil Su, and on the shore of a tract known as Darya (? Daryacha), 3 or 4 fursakhs north of the first Russian settlement, called by them Kaifa Su. This is probably Mikailovsk, the first settlement on the east coast made under the orders of the Governor-General of the Caucasus in 1859.

The position of Kizil Su is further fixed by reference to that of the Island of Cheleken, which may be presumed to be correctly placed in our latest maps derived from Russian sources. The Turkomans describe Kizil Su as lying opposite to Cheleken, and within a long gun-shot, the channel not so deep or wide as to prevent the passage of a horseman; while Krasnovodsk, as at present placed, has the whole depth and width of the Balkan Bay between it and Cheleken.

The new fort is said to stand on the spur of a hill near the shore of the bay, naturally scarped on one side, and surrounded by a stone wall on the other.

Water was at first obtained only from two or three wells, and by distilling the sea-water on board the steamers, but a good supply is now procured from new wells. The whole Darya tract is said to be incapable of cultivation; the soil being barren and sandy, and the supply of water deficient, even for the Turkoman herds.

The one spot where there is water and soil, not loose sand nor impregnated with salt, is near Kaifa Su, on the margin of a large fresh pool, 2 or 3 miles from the shore, which was some years ago occupied by the Russians, who have built houses and planted gardens. At Deh Sharbat, 4 fursakhs from Kizil Su, and beyond the pool, are some "obahs" of the Jafar Bai, subject to Russia, and it was there that the Tekkeh made their late raid in defiance of the Russian General. The troops at Kizil Su are kept supplied from Baku, even live stock and bread being brought thence. There is regular steam communication.

Some distance round by sea from Kizil Su, at the head of the Balkan Bay, is what is described as the port, or landing-place, probably the point of debarkation of a portion of the Khivan Force (the main body appear to have landed at Kinderli, further up the coast). It is known as Shakadam, or Mullakari, and also by the Yomuts as Kaisa Su. The first two names mark wells of fresh water. The place is not permanently occupied, but is looked upon as Russian.

From Balkan to the nearest Tekkeh "obah" is a distance

of 160 to 170 miles, and except in spring there is no grass, and but little water on the road. Thence to Byat Haji on the Atrak the distance is a little less, but the country more barren. No attempt to communicate direct was made during the late *reconnaissance.*

The tract known as the "Atak" is the belt of fertile land extending along the base of the Alburz, from the Heri road to Kizil Arvat, a distance of about 330 miles. Its width is varying and undefined; all beyond, that is to the north, is known as the "Kum," or desert.

The whole strip of country may, for convenience, be divided into three sections, the Atak-i-Kelat, the Darehgaz Atak, and the Akhal Atak,—a political and also a natural division, justified by some diversity of natural features.

The Kelat Atak commences near Ak Derband (at Zarabad, some miles west), and stretches west about 100 miles as far as Abivard, or Bavert, the older form. It includes in its width the course of the Tajand as far west as the wooded and fertile, though uninhabited, oases known by that name. Between the habitable and cultivable hill-skirt and the Tajand there is, it is true, a wide stretch of desert, but they have always shared the same fortunes, both either deserted or in the hands of Persians or Turkomans.

The Kelat range reaches the Atak in long, rugged spurs, pointing for the most part to the east, and subsiding in a maze of rough ravine-cleft undulations. Many fine streams rise in its glens and, reaching the plain, carry broad lines of pasture across the desert half-way to Tajand.

From the east, the first in succession of the streams is known as the Ab-i-Khur. On its banks are two or three villages known collectively as Chacha, re-occupied within the last two years, and having now a population of 100 families, taken from Kelat and Mash-had.

The second, the Ab-i-Mehna, on which is a small village or "obah" of Tekkeh Turkomans, who have been induced to settle there by the Khan of Kelat. Mehna was once, it is said, a city; in the time of the Sefavians a large town; later, in Nadir's time, a large camp of Tekkahs, and for fifty years a desolate ruin. The history of Abivart, Chacha, and Tajand is the same.

The third in succession is the Kelat stream, said to be not larger than the other streams, having, 20 miles above the hill-skirt, a width of 12 to 14 feet, with an average depth of 2½ feet and a swift current, a sufficient stream to irrigate a large stretch of corn-land. After flowing through the Atak for several miles

it waters the village of Chardeh, also lately re-occupied by the Persians. West of the Kelat stream is the Abi Archingan, on which are three small new settlements—Igdalik and Archingan.

The Abivard stream, known as the Rud-i-Kibkan, rises in the plateau north-east of Koochan, passing through the Kibkan glen, and reaching the plain at Abivard, where there are extensive ruins of the Arab period. The stream is one of the largest; it is drawn off to water some of the villages of Darehgaz.

The Darehgaz Atak extends from Abiverd, which is nominally within the limits of the State of Darehgaz, to Gawars, about 50 miles. It is watered by a stream rising in Koochan and flowing through Darehgaz. It has twenty villages along its length, some of considerable size, the total population being reckoned at 5000. Gawars is a Tekkeh "obah," the principal men of which are in the pay of the Khans.

Along the Darehgaz stream cultivation extends for 16 to 18 miles into the desert, and grain is raised more that sufficient for local consumption.

About N.N.W. from Darehgaz the Atak range runs in an unbroken line of heights formed by two spurs, one ending in a peak called the Zarin Kuh, overhanging the Darehgaz Atak, and draining its southern slopes into the Darehgaz stream; the other prolonged, without any great depressions, as far as Kizil Arvat, and thence subsiding far away in the desert; its drainage reaching the Atrak by the Ab-i-Sunt tributary. There are no streams, but many brooks and springs, along the base of the heights, from which the fertile belt extends for 8 or 10 miles. The "obahs" of the Akhal Tekkeh stretch in a line from Gawars to Kizil Arvat, and they hold also Ashkabad and Annau, Nissa, Mehna, and Karez, fertile tracts of pasture-land, enclosed by re-entering angles of the line of mountains. From Karez there is a route to Khiva, a journey of twelve days for camels, along a line said to be provided with wells at each stage. The Tajand stream does not reach so far west as this, but on the third day the "Oguez," or old bed of the Oxus, is crossed. The Turkoman horsemen reach Khiva in six days.

The first pass east of Astrabad is one from the Bostam Plain, crossing the Alburz to Gurgan, a line little likely to be used, and presenting also great natural difficulties. It was traversed some years ago by a Persian force of 40,000 men, with thirty guns. Leaving Bostam, it passes over the plain north-east, crosses a high shoulder of Khushyeilak Mountain, into the Nowdeh Valley at Chinask, and thence up the valley to Nardin, the Kalposh Plateau, and over a high ridge of the Gurgan.

The total of feet of ascent by this route would be from 7000 to 8000, the total descent from 8000 to 10,000. The Persian guns were, of course, dragged by hand all through.

The road over the Khushyeilak Mountain would in ordinary winters be closed for two or three months. The Nardin and Nowdeh Pass, the next in succession, though little used, is shorter, and has fewer natural difficulties than perhaps any other line that could be selected in the whole length of the Alburz. It lies in a direct line between Astrabad and Jajarm, in the very track of any force marching from the sea to the west. For the construction of a railway it offers facilities only exceeded by those of the more circuitous route to the east by the Gurgan Defile.

From Jajarm to the Sang Surakh Pass (Route 17) the road is open and good, and the ascent trifling. The foot of the same pass may also be reached from Magas, in the Bostam Plain, by an ascent of only a few hundred feet up a long line of open, easy plateaux, opening on to the Murtaza Ali Maidan.* From the foot of the Pass the hill above Maiamai is distinctly visible, bearing due south.

The following gives the approximate distances and gradients to the edge of the Gurgan Plain:—

	Miles.	Height in Feet.
Murtaza Ali Maidan to Nardin—		
Ascent	2½	800
Easy, undulating	3½	..
Descent	2	250
Level	1	..
Nardin to Nowdeh—		
Gentle ascent	4	100
Pass (ascent)	2	1400
Stream (descent)	2	1700
Kanchi (descent)	23	2200
Nowdeh (descent)	19	1600

From the Sang Surakh Pass to the bottom of the Nardin Pass the road is covered with snow in winter, but it is nowhere much exposed.

From Nardin northward to the Atak the only pass said to be practicable for guns is that given in Route 18, but any line crossing the whole of the Atrak tributaries must necessarily be a difficult one. A road seeking to gain the Atrak without

* Maidan.

making a detour through the Atrak Plain would certainly meet with fewer difficulties by crossing the main chain west of the Atrak watershed.

Bujnurd, Nishabur, and Mash-had, may be reached by the old highway of Shah Abbass, which runs up the Gurgan stream to Gurgan, through the defile, Chanda Abbass, Rabat-i-Karabil, Rabat-i-Ashk, and Shaoghan; thence to Bujnurd by the Pass of Feroza, and to Nishabur through the Darband-i-Hissar, and the Jouvain Plain. Mash-had by the same route, or through Bujnurd.

The upper part of the Gurgan Valley is narrow, but the road good and gradients very easy, for the ascent in 18 to 20 miles cannot be above 2000 to 2500 feet. The defile of Gurgan had once a good road through it and beyond to the open plateau, which is said to be even now, in spite of a dense growth of forest, passable for horsemen. The plateaux undulate very easily, and have a width of several miles. The Bujnurd Pass is difficult, but that of the Darband-i-Hissar exceedingly easy. The route keeps throughout so low a level that no great inconvenience could ever be experienced from snow in winter. For a railway to the east no better line could be selected.

From Koochan to the "Atak" there are two passes—one by Aughaz (Route 13), of which all available information has already been given, the other by the Dawand Pass, a line nearly as good as that by Nowdeh, but attaining a greater elevation, and consequently more liable to be closed in winter; that portion of it also lying across the high plateau is much exposed.

The following gives the approximate distances and gradients:—

KOOCHAN TO DURANGAR.

	Miles.	Feet.
Ascent (gentle)	24	..
„ (foot of Pass easy)	9½	400
„ Pass „	2	900
Deep undulations to Zobaran Pass	23	..
Descent to Koochan	5	1000

From Koochan east there are no passes that can be considered practicable for wheel-carriages, or that could be rendered so with any amount of labour at short notice.

With the Nardin or Nowdeh and the Gurgan Pass held, a force marching eastward from the sea would be compelled to

make a march of some days northward from the Atrak through a waterless country to turn the Atak chain, and thence to march 350 miles through a country producing barely enough to support the present nomadic population to Ak Darband, whence the country south and east for a great distance is uninhabited, sufficiently watered, and very rough. The detour would add most materially to the distance to be traversed, and would double difficulties of supplies and communication.

NOTE.—The information I was able to gather regarding the nature of the difficulties presented by the outer range of the Atak Hills was unsatisfactory, but all accounts agreed that the road from Kara Killa to the Atak was passable for light guns, and the country to the west much broken, barren, and waterless.

Notes on the Yomut Tribe. By KAZI SYUD AHMAD.

The Yomuts, near Astrabad, are said to comprise 60,000 families, 20,000 of which are settled near Astrabad. The part of the country which they inhabit extends from the Dahana-i-Hasan Kuli, near the Caspian, to Gunbad-i-Quas, which forms the boundary between the tribes of Goklan and Yomut; the rest are settled from Balkhan to Khiva.

They are divided into two divisions, viz.—1, Chuni; and 2, Sharáf (better known as Ata Bai and Jafar Bai. Ata Bai is divided into two clans—Ata Bai and Aq. Ata Bai has 15 Tirahs—

1. Sahna.
2. Taqi.
3. Yanpai.
4. Sari Chuni.
5. Mohamud Unluq.
6. Tanak.
7. Khanti.
8. Qagiti.
9. Qanqarma.
10. Tana.
11. Dogunchi.
12. Kasarkha.
13. Kásah.
14. Ashur Guk.
15. Qara Dashli.

Aq has two clans, viz.—1, Uzain Aq; and 2, Qisqa Aq. Uzain Aq has three Tirahs—

1. Shaqi.
2. Guk.
3. Habibli.

Qisqa Aq has five Tirahs—

1. Shir Mohamudli.
2. Nur Mohamudli.
3. Qiziljah.
4. Yulma.
5. Hirra.

Tribes which are connected with Ata Bai are four in number—

1. Daz.
2. Kuchak.
3. Qan Yukhmaz.
4. Igdar.

Daz has four Tirahs—

1. Panqa.
2. Hanqa.
3. Durd Ata Ughli.
4. Chin Subli.

Kuchak has four Tirahs—

1. Aslanjuq.
2. Ustajuq.
3. Khurtum.
4. Guti Qara.

Qan Yukhanaz has four Tirahs—

1. Hataku.
2. Qulja.
3. Saricha Kur.
4. Makhdum.

Igdar has four Tirahs—

1. Aq Irkakti.
2. Qara Irkakti.
3. Bidraq.
4. Emir.

Jafar Bai is divided into two divisions, viz.—

1. Yár Ali.
2. Nur Ali.

Yar Ali has nine clans—

1. Arikh.
2. Kal.
3. Kusati.
4. Qizil.
5. Saqqati.
6. Burkhas.
7. Ide Tumàj.
8. Unuq.
9. Changan.

Nur Ali has eight clans—

1. Qariwange Kur.
2. Pank.
3. Qaranjik.
4. Qaraja.
5. Ughurjati.
6. Katita.
7. Bahlaka.
8. Qalaq.

Tribes which are connected with Jafar Bai are five in number—

1. Yalghi.
2. Daweji.
3. Qara Daqti.
4. Tatar.
5. Qujuq.

Yalghi has seven Tirahs—

1. Siqra.
2. Qira.
3. Mirzati.
4. Watrilti.
5. Aaliq.
6. Chirashak.
7. Ipri.

Daweji has nine Tirahs—

1. Udak.
2. Miut (Meút).
3. Ichmak.
4. Abdal.
5. Khivali.
6. Kirai.
7. Chobnash.
8. Buqu.
9. Gurganli.

Qara Daqli has seven Tirahs—

1. Pahlawan.
2. Uzin.
3. Pira-an.
4. Yalitli.
5. Idakti.
6. Qalmuq.
7. Urus.

Tatar has three Tirahs—

1. Siqarli.
2. Aq Qimishli.
3. Aghilmishli.

Qujuq has six Tirahs—

1. Kaka.
2. Khivachi.
3. Qarata.
4. Aqchati.
5. Qiriq.
6. Dan Qiriq.

LIST of ROUTES in the EASTERN ALBURZ TRACT, including one from HERAT to MERV.

No.	ROUTE.	Miles.	Fursakhs.
1	Herat to Merve	..	50
2	Mash-had to Sarakhs	..	31
3	„ Kelat-i-Nadiri and Sarakhs	..	24
4	„ „ „ Atak	106	..
5	„ Darehgaz by Radkan	111½	..
6	Darehgaz to Sarakhs	..	27½
7	„ Merv	..	38 to 40
8	„ Balkan	..	94 to 97
9	„ Koochan by Dawand Pass	70	..
10	Koochan to Darehgaz by Allaho Akbar Pass ..	45	..
11	„ from Askabad and Annau	39	..
12	Ishkabad and Annau to Durangar (Route 9) ..	..	4½
13	„ „ Koochan by Aughaz ..	..	11½
14	Bujnoord to Kara Killa and Kizil Arvat	..	38½
15	„ „ Atak	..	22
16	„ „ Gurgan and Astrabad	..	26½
17	Jajarm to Astrabad by Nowdeh	..	131½
18	Nardin to Kizil Arvat	..	27½
19	„ Gurgan	..	12
20	Gurgan to Atrak (River)	..	11½
21	Astrabad to Atrak	..	10
22	Hasan Kuli to Kara Killa	..	39

NOTE.—Routes, of which distance is given in fursakhs, have been derived from native information usually with the aid of a rough sketch-map.

FURSAKHS.—Khorassan fursakh, calculated at 4½ in plain and 4 in hills.

Distance in fursakhs in hilly country reduced one-third or one-fourth, according to ground, for direct distance. The Kurds usually measure stages by the hour, calculating one fursakh an hour. This gives 4 to 4½ miles (for a horseman) on level ground and 2½ to 3 miles in the hills.

MILES.—Calculated at 4½ miles per hour on level smooth ground, the ordinary marching pace of a horse.

In rough or broken ground at 4 miles.

In mountains 2½ to 3 miles.

Ascent of gradients measured by Aneroid Barometer, mean of readings of 2 instruments.

ELEVATION.—Calculated from mean of several observations of boiling-point.

Temperatures from standard Thermometer.

ROUTE No. 1.

HERAT TO MERV.

Stages.	Distance. Miles, &c.	Distance. Total.	Rivers, Passes, and Villages.	General Description.
Khusk Rabat ..	6 fur.	..	.. ..	Across plain north from Herat.
Kara Tápah	12 „	18	.. ..	Plain for the most part. One pass across low hills.
Archa Hauz-i-Khan	6 „	24	.. ..	Plain.
Pul-i-Khishte ..	5 „	29	Murghab River, not fordable.	Plain. At this stage there is a good spring, and usually camps of Sarik and Salor Turkomans from Punjdeh. It is on the banks of the Murghab, half-way between Punjdeh and Merv.
				Plain on banks of Murghab.
Ghulkhandi	6 „	35	.. ..	Along banks of Murghab. There being grass and water on the whole line, caravans can encamp half-way. Yolatan is occupied by Sarik and Salor Turkomans.
Yolatan	12 „	47	.. ..	
Merv	3 „	50	.. ..	Plain, cultivated for the most part, and covered with camps of Tekkeh.
				NOTE.—The fursakh of Khorassan, especially in plain ground, may be reckoned at 4¼ miles. All the stages on the route have grass and water.

ROUTE No. 2.

MASH-HAD TO SARAKHS.

Stages.	Miles, &c.	Total.	Rivers, Passes, and Villages.	General Description.
Kanagosha	3½ fur.	..	.. ..	Plain, E.N.E. from Mash-had.
Mozdaran	9½ „	13	Kashaf Rud at five fursakhs fordable, water said to be brackish lower.	Plain as far as Kashaf Rud. Thence over undulating ground on hill-skirts along north bank. Plain to south high, undulating, fertile in parts, without any population known as Dasht-i-

				Pusht-i-Kuh-i-Jam, being bounded on the south by ridges lining the Jam stream. Mozdaran has several watch-towers, held by (nominally) 50 foot and 50 horse.
Ak Darband	9 „	22	Defile	Following stream through low hills. At one fursakh pass post of Gar Mozdaran on south bank; at 2½ fursakhs post Tavar, north bank; 3½ fursakhs post Darz Verdi, north bank; 5½ fursakhs post Bast i-Sang-i-Dak; at 7 fursakhs Bast-i-Ibrahim Khan; thence 2 fursakhs to Ak Darband. The defile is defended by several towers held by 50 horse and a few infantry.
Sarakhs	9 „	31	Descend pass to Shorja, said to be passable for guns.	At one fursakh, descending for some distance, Shorja, Persian post of 140 men, 4 or 5 miles below and to right of road is the junction of the Hari road and Kashaf road or Ab-i-Mash-had, thence known as the Tajand. From Shorja level barren plain to Sarakhs. Note.—This route is put down as given, but it is probable that the distance from Mozdaran to Ak Darband has been exaggerated, as also the distance between the outposts on the road. In rough hilly ground the fursakh is usually estimated by the time it takes the traveller to cover his stage. Sarakhs has no population save a Persian garrison of 400 infantry, and 300 or 400 people, the scum of the bazaars of Mash-had, sent there lately to colonise. The fort is large enough to contain all, and built, it is said, on a European plan, but it is old and dilapidated and defended only by eight light guns. The soil is fertile and water ample, wood is cut on the river-banks. The garrison, however, are prisoners, being unable to move out except "in force." Supplies of grain are purchased from the Merv Turkomans.

ROUTE NO. 3.

MASH-HAD TO KELAT AND SARAKHS BY KHOUR.

Stages.	Distance. Miles, &c.	Distance. Total.	Rivers, Passes, and Villages.	General Description.
Kanagosha	3½ fur.	..	.. ..	Large villages in the Tabatkhan Beluk. Road through low hills.
Foronad or Gujki ..	2½ „	6 fur.		
Khour	6 „	12 „	.. ..	Across high ridge of the Taka Khana Mountain, by a road over which it is said guns have been taken. Accounts as to the road differ, but it is probably very rough and bad, and the light guns certainly taken to Tajand must have been transported by hand. NOTE.—From the summit of the Karadagh Mountain a good view is obtained of the whole Khour route, and a more impassable-looking country for wheels it would be difficult to find. Khour is a large village lying on the north side of the ridge, at the head of the Chacha Valley.
Kelat	9 „	21 „	.. ..	From Khour to Kelat is 9 fursakhs north and west, over a very rough country, passing the villages Zu and Karategan, lately re-peopled.
Khour to Chacha ..	4 „	16 „	.. ..	Down a deep valley, shut in by high spurs of the Taka Khana. The descent in the 16 miles is probably not less than 6000 feet. Chacha lies within the outer range of hills, and is a large village of now 100 houses, with fine crops of rice and wheat. It was re-occupied only last year. A fine stream waters it. Tajand lies 10 fursakhs N.N.W. across a barren plain. It was till two or three years ago occupied by Turkomans from Merv.
Sarakhs	8 „	24 „	.. ..	Following the stream, 2 fursakhs to Karachacha, a village in the plain, also lately occupied; and six fursakhs east to Sarakhs, across a barren plain. NOTE.—Between Khour and Ak Darband there are a few paths practicable for mounted men, but very difficult. These are or ought to be held by small posts. No laden animals pass.

Route No. 4.

MASH-HAD TO KELAT AND THE ATAK.

Kardeh	24 miles 6½ fur.	..	.. .. Kashaf rud at 5 miles. Rehzan, 17½ miles. Andarukh 19½ miles. Defile of Kardeh. Ascent from Mash-had about 900 feet.	Leave Bala Kheyaban gate and turn E.N.E. through gardens. At 1½ mile pass gardens and fort of Samazgand, and bear north past dome of Khaja Ratu left. At 5 miles cross Kashaf rud by stone bridge, stream small, easy banks, sound bed, and no depth of water. Thence over plain rising gently to village Razan, 17½ miles, on hill-skirts. Thence, between long undulating gravel slopes to Andarukh, 50 houses, 19½ miles. At 20 miles enter Darband-i-Kardeh, narrow defile, shut in by precipices, 800 to 1000 feet in height. Mountains on either side of limestone and trap, tabular, and accessible. Stream from Kardeh finds its way through the defile, which in places has a width of less than 50 yards. At 22 miles leave stream and pass over low hills of conglomerate, skirting the stream again at 23⅓ miles. Thence west half mile to Kardeh, a small village of 20 or 30 houses, the property of the Khan of Chulai. Supplies procurable in abundance with notice. Road, a fair bridle-path, which might be made easily practicable for guns.
Wardeh	28 miles 8½ fur.	52 miles 14¾ fur.	.. ..	From Kardeh follow stream up a narrow tortuous defile, winding from north-west to north and E.N.E., and shut in by high inaccessible cliffs, leaving a passage, frequently less than 50 yards. At 7 miles pass small village Aul, 20 houses. At 9½ miles, rock inscription of 926 Hijra, right bank of stream. At 19 miles small tributary from glen to left, at head of which lies large village Bolghor, one mile distant bend north following stream, and at quarter mile pass road to village Sij, falling in right rear. Defile shut in by cliffs of sandstone. At 24 miles emerge on open valley draining from east and west. Two roads to Kelat branch off east and west. The latter said to be the worst. At 26 miles cross watershed line into valley

ROUTE No. 4.—*continued.*

MASH-HAD TO KELAT AND THE ATAK.

STAGES.	Distance.		Rivers, Passes, and Villages.	GENERAL DESCRIPTION.
	Miles, &c.	Total.		
			Ascent from Kardeh about 1800 feet.	draining into the Atak, and bear left. At 27 miles cross rocky spur, by steep and bad ascent, and descend by rough path into glen of Wardeh, also draining into Atak. Road for 20 miles impracticable for any wheeled carriage, and commanded by inaccessible cliffs. Laden camels pass without difficulty. Last ridge above Wardeh passable by laden mules with difficulty. Camels make a long detour. Wardeh 20 houses. Supplies very scanty.
Kelat-i-Nadiri ..	22 miles 6½ fur.	74 miles 21 fur.	.. ..	Leave Wardeh east down glen, at 2 miles pass village Baghchand six houses, with fort on rocky hill, and turn E.N.E. over low hills of sandstone, and coloured marls and shales. At 5 miles bend north and descend deep glen with steep slopes of mottled clays and marls, and jutting spurs of slate and limestone, the strata violently contorted. At 12½ miles strike small stream flowing from west, and follow its course through a very narrow defile, shut in by cliffs, leaving a passage only sufficient for one horseman. At 16 miles enter open valley, the north side of which is bounded by the south wall of the natural fortress of Kelat. Thence following stream, bending west, down the valley. At 20 miles turn north with the stream and pass through a narrow gap in the enclosing ridge known as the Darband-i-Arghun Shah, closed by gates. At 22 miles following stream reach village Gio Gunbaz and Nadir's tower. Road from 5 to 16 miles impassable for wheels or laden camels

Chardeh	28 miles	106 miles	Descent from Kardeh 3000 feet.	(camels using the road as far as Wardeh go no further, taking fire-wood cut in the cypress—*juniperus excelsa*—forests to Mash-had). From Kalat to Chardeh in the Atak is about 28 miles. To the Darband-i-Napht, in the north wall of Kelat, a narrow gap similar to that of Arghun Shah, is 7 miles following the stream. Road, fair bridle-path, but impassable for guns. Thence, winding through a narrow valley, enclosed by low hills of clays, marls, and sandstone, 16 miles to the hill-skirt. Thence to Chardeh, on the banks of the stream, at 28 miles. Chardeh has 50 to 60 houses, settled by Turkomans, under the protection of the Khan of Kalat.

Route No. 5.

MASH-HAD TO DAREHGAZ BY RADKAN.

Kazimabad	12 miles 2½ fur.	..	.. ..	Leave Mash-had by the Bala Kheyaban gate, and follow the main road up the valley N.W. at 5 miles, pass ruined Rabat and fort of Bahrabad. At 12 miles walled village of Kazimabad, 15 houses. Supplies plentiful. Road level and good.
Gunabad	14 miles 3½ fur.	26 miles 6 fur.	.. .. .. Killa Askanya, 7 miles. Killa Eshankulla, 9 miles. Killa Sadad Khan. Killa Vakil Khan, 11 miles.	North-west following main road. At 7 miles Killa Askanya, right; at 9 miles Killa Eshankulla, left; Killa Khan Sadad, right. At 11 miles Killa Vakil Khan, right. At 12½ miles country cut up by ravines, draining into the Kashaf rud; roadway remains good and passable for wheels. Road heavy in parts from recent rain, but good all along. Gunabad, large village of 100 houses; supplies ample.
Chinaran	12 miles 3 fur.	38 miles 9 fur.	.. .. Killa Ibrahimabad, 2 miles.	North-west through gardens for one mile. At 2 miles Killa Ibrahimabad, right. At 3½ miles Killa Sulogird, half mile left; 4½ miles Killa Nau Buhor right; 7 miles, village and gardens, Shaf-

ROUTE No. 5.—*continued.*

MASH-HAD TO DAREHGAZ BY RADKAN.

Stages.	Distance. Miles, &c.	Distance. Total.	Rivers, Passes, and Villages.	General Description.
			Killa Sulogird, 3½ miles. Killa Now Buhor, 4½ miles. Shaffiabad, 7 miles. Hajiabad, 8 miles.	feabad; 8 miles, Hajiabad. At 9½ miles cross small stream flowing north to Dastgird. At 10½ miles cross dry bed of stream from the hills south. High steep bank with ramp passable for wheels. Road sound and firm the whole way, and for the most part gravel and kunker. Country level and unbroken. Chinaran, large walled village, 400 houses. Zafaranlu Kurds.
Radkan	14 miles 3½ fur.	52 miles 12½ fur.	Jaukar, 2¼ miles. Kelat Amjan, 2½ miles. Kelat-i-Arab, 8½ miles. Deh Sunnder, ruined village, 5½ miles. Deh Mazanly. Deh Sar-i-zah. Gul Khatun, 7 miles. Deh Mati, 8 miles.	N.N.W. across cultivated plain for one mile. Direct road to Koochan branches off left. Plain uncultivated and undulating to Joukar. At 8 miles clearing the last villages of Chinaran, the road passes over wide level pasture-land. A marshy stream from the head of the valley is past by a good ford. At 11½ miles the Mil-i-Radkan, a fine masonry tower, 95 feet high, with Cufic inscription, is passed. Radkan is a large village of 1000 houses of Kywanlu Kurds, defended by double mud-walls, towers, and ditch.
Killa Yusuf Khan	25 miles	77 miles	Deh Zadees, Abshor, Dautli.	North, over level pasture-land for some miles. Thence passing the villages Deh, Zades, Abshor, 2 miles further, Dautli 4 miles further, whence 2 miles to Killa Yusuf Khan, a large village of 150 houses of Kywanlu Koords. Supplies, &c., ample.
Tavil	13½ miles	90½ miles	Badkhor, 15 miles.	Follow stream, tributary of the Atrak (here 10 or 12 feet by 2, but said to be not perennial), E.N.E. to the village of Badkhor,

			Fanow, 8½ miles. Tavari, 10½ miles.	situated at the head of the valley, and at the entrance of a defile, 5 miles. At 16 miles enter defile, narrow, and completely commanded by low rocky hills, and follow windings of stream, keeping a north-easterly direction. At 8½ miles pass hamlet of Fanow, 12 houses. At 10½ miles defile opens out to half mile, with a long stretch of cultivation, in centre of which stands village of Tavari. Two small streams flow in on left, and main valley divides east and north. From the west flows a small stream, draining the Daulatkhana plateau. Road passing over low spur behind Tavari, flows east branch of valley due east to Tavil (23½ miles), a small Kurd hamlet of 10 families. Supplies procurable. From Badkhor to Fanow and Tavari, 4 miles, the defile is narrow, and traversed by a winding stream, with 2 or 3 feet of water, and a muddy bottom for the most part; guns might pass with a little labour. Thence to Tavil the road is open and good.
Chapushlu	21 miles 8½ fur.	111½ miles	.. .. Maidan Khana Pass, 900 feet. Defile Darband-i-Kibkan. Darband, 7 miles. Allah-ho Akbar Pass.	Leave valley north-east up lateral glen, road steep and rugged, and impassable for guns. Camels are said to go, and guns have been taken round a long detour up the valley to a point where the hill is less rocky, though steeper (three or four light guns were dragged by hand). Ascending glen for 2 miles reach plateau of Maidan Khana. Thence across easy undulations E.N.E., and at 3 miles descend north-east into narrow defile, following small stream. At 6 miles pass through gap in main chain known as Darband-i-Kibkan and enter upon valley of Kopal. Thence on an easterly bearing, pass at 7 miles village of Darband, the first in Darehgaz. At 8 miles pass fort of Kopal, with hamlet, cross stream, and follow it to 9½ miles; a total descent from Maidan Khana of 1400 feet. Leave valley winding E.S.E. to east towards Abiverd and the Atak, and turn north up a narrow glen, in a high spur of the main range, running out to the south-east. At 12 miles reach summit of pass Allah-ho Akbar,

ROUTE No. 5.—*continued.*

MASH-HAD TO DAREHGAZ BY RADKAN.

Stages.	Distance. Miles, &c.	Distance. Total.	Rivers, Passes, and Villages.	General Description.
			Agdash, 15 miles.	a slight depression in the spur. Ascent 1000 feet. Thence descent 2000 feet, to the village of Agdash, 15 miles over plain sloping easily to the north-east reach Chapushlu. Total descent from summit of pass (about) 3000 feet. The descent of the Maidan Khana Pass is steep and impracticable for guns, but the hill slopes are soft and a road might easily be cut. The ascent of 1000 feet to the crest of Allah-ho Akbar is impracticable, the hill-side being formed of bare limestone rock, and seamed with deep precipitous gullies. The descent of 3000 feet is good, the road having apparently been made, and guns might with care be driven down. The valley following the Kibkan stream to Abivard also appears quite impracticable for guns, and is shut in by precipitous spurs on both sides.
				From the village of Darband an alternative road goes back over the shoulder of Kuh Imarat, a mountain to the east, and, passing to the east of Tavil, reaches Radkau in the valley. It is shorter, but avoided by caravans on account of the steep and bad ascent of the Dumji Pass.
Mahmudabad .. **and the Atak** ..	8 miles 8 „ — 16 „	.. 127½ miles	.. ..	To Mahmudabad, the chief town, or village of the Darehgaz State, is a distance of 8 miles, over a level plain, and through a narrow pass in a low spur running out into the plain from the mountains on the east. Thence to Khairabad and the village in the Atak is 8 miles. A low range of hills formed of soft

				clays and marls being crossed by a good road. By a short détour to the west the Atak may be gained without crossing the enclosing hills through a defile, by which the Darehgaz stream finds its way to the Atak. The defile is narrow, and might be easily defended, and the low, enclosing range, though everywhere passable for horsemen, has a steep slope to the south, and a broad crest, affording good positions. From Darehgaz there is a road across the hills to the east, to Kelat-i-Nadiri, travelled by Colonel Baker and Lieutenant Gill, R.E., in 1873.

Route No. 6.

DAREHGAZ TO SARAKHS.

Atak or Turan ..	12 miles 3 fur.	..	.. ..	North-east from Mahmudabad by the Darband-i-Ger Bheg, or across the low hills to the south passing at 8 miles, Khairabad.
Abivard	6 „	9 fur.	.. ..	East, along hill-skirt, over level ground. Abivard is inhabited; has ample pasture; watered by a fine stream. Nearest village, Kivabad, of Kelat, lately re-peopled, some miles higher up.
Chardeh	5 „	14 „	.. ..	East along hill-skirt, passing at about 10th mile Archingan, a village lately re-occupied and watered by a stream flowing from the Kuh-i-Imarat, or Hazar Masjid, and passing through Kelat.
Mehna	3½ „	17½ „	.. ..	About south-east along the Atak to Mehna, a village lately occupied from Kelat, watered by a stream from the east of Kelat.
Kara Chacha	4 „	21½ „	.. ..	South-east. See Route No. 3.
Sarakhs	6 „	27½ „	.. ..	(South-east. See Route No. 3.)

ROUTE No. 7.

DAREHGAZ TO MERV.

Stages.	Distance. Miles, &c.	Distance. Total.	Rivers, Basses, and Villages.	General Description.
Tajand	10 fur.	..	.. ..	From Darehgaz to Merv is a journey of six days for laden camels, about 150 to 160 miles. At 35 to 40 miles the Tajand is crossed, a shallow stream, flowing through a sandy waste, and fringed by thin scrub of tamarisk and willow. Thence four long stages across a desert, with wells of brackish water at each halting-place. Laden mules also accomplish the journey.
Merv	28 to 30	38 to 40		

ROUTE No. 8.

DAREHGAZ TO ANNAU, KIZIL ARVAT, BALKHAN.

Nowkhandan ..	8 miles 2 fur.	..	.. ..	North-west across the cultivated plain of Darehgaz, following the course of the stream draining the valley. Nowkhandan is a large village of 700 houses, surrounding a high mound, on which stands the fort. Gardens and vineyards extend for some miles up and down the stream.
Annau and Askabad	8 "	10 fur.	.. .. Gawars. Annau.	Leave the valley of Darehgaz by the Dihana or pass of Askabad (north-west), which is easy and practicable for light guns, and cross over low hills to the Atak; passing, at the edge of the plain Gawars, the first Tekkeh "Obah." At 8 fursakhs reach Annau, 300 tents, and 2 miles further, Askabad, 1000 tents.
Kurjow	10 " to 11	18 " to 19	.. ..	Along the Atak skirting the hills.
Akhal	10 " to 11	28 " to 29	.. ..	Ditto.
Karez	8 " to 7	36 " to 37	.. ..	Ditto.

Doran	10 fur.	46 „ to 47	.. ..	Ditto.
Bami Burma	9 „	55 „ to 56	.. ..	Two large "obahs," about one mile apart, destroyed by the Russians under Markosoff in 1873.
Kizil Arvat	7 fur.	64 „ to 65	.. ..	The country passed over, as far as Kizil Arvat, is level; barren for the most part, but not a sandy waste, as is the desert, or "kum," beyond. No less than 40 Tekkeh "obahs," each with its small stream from the mountains or perennial spring, are passed; and there is extensive cultivation. The population, of from 20,000 to 30,000 families, subsisting without the necessity of purchasing.
Balkhan, 3 days ..	32 „ to 32	94 „ to 97	.. ..	From Kizil Arvat to Balkhan is a ride of three days, making stages of 10 fursakhs.* 40 to 48 miles a day. The country is broken by sand hills and low rocky ridges, the last spurs of the Alburz, which extends in that direction across the desert as far nearly as Balkan. The tract is said to be elevated above the desert north and south of it, and to have a few springs and pools of fresh water, and in spring abundant pasturage in some places, frequented by the Yomuts "Charwars," or nomads. Caravans have never passed that way, but the Tekkeh have twice lately ridden across to attack the Russians on the "Darja," or "Daryacha," the lake of Kaifa Su, described as a small lake of fresh water collected from the rainfall on the surrounding tracts, on the edge of which gardens and houses have been commenced.
				Thence to Kizil Su, the permanent settlement or fort of Krasnovodsk, and to Kaifa Su and Shah Kadom, the landing-place at the head of the bay, is a distance of 2 to 3 fursakhs.
				* NOTE.—Distance is given as stated to me, but each day's journey was probably much longer. For, assuming that Astrabad and the mouth of the Balkan inlet have been laid down from correct Russian sources, and the position of Kizil Arvat from Bujnurd correctly given to me, as I believe it to have been, the distance from Kizil Su to Kizil Arvat should be about 170 miles.

ROUTE No. 9.

DAREHGAZ TO KOOCHAN BY DAWAND PASS.

STAGES.	Distance.		Rivers, Passes, and Villages.	GENERAL DESCRIPTION.
	Miles, &c.	Total.		
Nowkhandan ..	8 miles 2½ fur.	..	.. ..	Route No. 8.
Durangar	24 miles 6¾ fur.	32 miles 9¼ fur.	.. .. Bujikaleh, 2½ miles, 20 houses. Zulfan, 3½ miles, 30 houses; Khalkanlu Tozanlu, 20 houses ½ mile left. 5½ Fair Ali Beg, 20 houses. Shikivanlu, 20 houses, 10 miles. Zainadilo, 15 houses, 12½ miles. Sang Surakh, 16½ miles. Durangar Turki, 18½ miles, 15 houses.	North-west from Nowkhandan through gardens and vineyards. At 1½ mile pass Khallalu, and gain wide open cultivated plain. 5½ miles Kuh Kuhchar, a spur of the main range runs out into the plains, rising to a height of about 1200 feet. Thence bear west, skirting right flank of mountain, and follow stream up the valley, which contracts to 1 mile in width; ¼ mile from Zainadilo valley bends W.N.W. Sang Surakh lies on the slope of a spur on right bank, and closes a pass leading from the Akhal settlements in the Atak; the road lying north-west up a glen, and over Kuh Asalma to Annau and Askabad, distant 16 miles (4 fursakhs). At Sang Surakh, pass through narrow gap in mountains W.S.W. and turn north-west. At 23 miles valley bends sharp S.S.W. At 24 miles gardens and hamlet of Durangar-i-Kurdi, four hamlets of 20 to 25 houses in each, of Kaikanlu Kurds. Supplies ample. A road to Kalta Chinar and Annau leads off north-west from village up narrow glen.
Imamguli	20 miles 6 fur.	52 miles 15¼ fur.	.. .. Dawand Pass, 900 feet.	Follow glen S.S.W. At 4 miles cross stream, and leave it, issuing from narrow gorge on right, through which lies road to Shorak Durhadam, villages of Koochan, distant 5 fursakhs. Thence on south bearing up narrow, rocky glen. At 9½ miles reach foot of Dawand Pass. Road passable for wheels, but narrow, and commanded by rocky heights. Ascent of Dawand Pass, 2 miles, 900 feet; road fairly good, and ascent for most part easy.

Koochan	**18 miles**	**70 miles**	.. ..	**From crest of pass, south, over bare open downs, leading over low gap in Chuinli Ridge. At 13½ miles pass Chuinli, 20 families, Marjanlu Kurds, and cross low, easy ridge, into wide, undulating valley of Zublilig, draining north into the Durangar stream. Thence north over steep undulations to stream and village of Imamguli, 60 families, Zafaranlu. Supplies procurable.** **NOTE.—The Dawand Pass is exceedingly easy, and might with little difficulty be made passable for guns.** S.S.E. At 1 mile cross a low ridge on right, and on south by good road over the Katirchi Plateau. At 5½ miles cross low ridge of Alumli by good road, and enter plateau of Daulatkhana; crossing which, at 15 miles, reach the Gobaran Pass; thence to Koochan, 5 miles, over low hills. Light guns have been taken to the Atak by this road, and it might with little labour be made passable for any wheeled carriage.

ROUTE No. 10.

KOOCHAN TO DAREHGAZ BY ALLAHO AKBAR PASS.

Killa Yusuf Khan	**10½ miles**	..	.. .. Tilab, 1 mile. Karbalai Aghassi, 3½ miles. Hy Hy, 7½ miles. Chalaki, 10½ miles.	Leave Koochan by east gate and follow Mash-had road. At 1 mile cross stream (shallow, with sound bed, 16 to 18 feet by 2 feet depth) and pass through village Tilab, and on the east following hill-skirt. At 3½ miles Killa Karbalai Aghassi, with square mud-fort on mound, 1 mile right. A road turns off left through hills to Daulatkhana. Turn E.S.E. across plain, and at 7½ miles pass village Hy Hy. Thence bend towards gap in hills bearing due east and follow course of stream, passing village and ruined fort of Chalaki. At 10½ miles reach Killa Yusuf Khan, on the borders of Koochan and Radkan.
		108½ miles	.. ..	Thence to Darehgaz by Route No. 5, 34½ miles.

ROUTE No. 11.

KOOCHAN FROM ASKABAD AND ANNAU.

STAGES.	Distance. Miles, &c.	Distance. Total.	Rivers, Passes, and Villages.	GENERAL DESCRIPTION.
.. ..	..	.. 39	.. .. Awardan, $2\frac{1}{4}$ fur. Buzbalk. Durbadam, $3\frac{1}{2}$ fur. Shorak, $4\frac{1}{4}$.	From Askabad, $1\frac{1}{3}$ fursakh over plain, and enter glen Kuh Asalmá on left. Kuh Dashtai right. At $2\frac{1}{4}$ fur. (9 miles) pass Awardan, ruined fort, with spring known as Buzbalk. On, for a short fursakh (3 miles), to pass of Balikhar, a long easy ascent. At 14 miles $3\frac{1}{2}$ fur., after a long, gradual descent, reach Durbadam (300 houses), Kurds. Thence, to 17 miles ($4\frac{1}{4}$ fur.) up glen, by good road, to Shorak, 100 houses. At 18 miles, $4\frac{1}{3}$ fursakhs, a long, easy, ascent, on to plateau of Imamguli. Thence, a short fursakh, 3 miles, to village Imamguli, and to Koochan, as by Route No. 9. Road said to be as good as that by Dawand Pass.
Imamguli	$5\frac{1}{4}$ fur. 21 miles.		.. ..	
Koochan	18 "		.. ..	

ROUTE No. 12.

ASKABAD AND ANNAU TO DURANGAR IN ROUTE No. 9.

.. ..	..	..	.. .. Sang Surakh.	From Askabad (5 miles), $1\frac{1}{3}$ fursakh (short), across plain, enter valley, and follow it over level ground to 11 miles, wide, open, pasture of Nissa. Thence a road branches off to Sang Surakh (Route No. 9) by which light guns belonging to the Hissam-u-Sultana's force reached Askabad.

Kalta Chenar ..	3½ fur.	..	.. ..	From Nissa pasture follow narrow easy glen, 1 fursakh to Kalta Chenar. a large village of 100 houses of "Sunnis;" a remnant of the populations of the old towns of the Atak, Mehna. Annau, Askabad, still known as Mehnais, Annauis, &c. Thence to Durangar descent of 4 miles, 1 long fursakh, over a good road, down a narrow glen. The pass from the Atak, over low part of the Asalma Ridge, is described as easy and practicable for light guns dragged by hand.

Route No. 13.

KOOCHAN FROM ASKABAD AND ANNAU BY AUGHAZ.

Awardan	2¼ fur.	..	.. ..	To Awardan as in Route No. 11. Thence 2 miles over level pasture passing the Kerawul Khana-i-Zilan, and to 3½ fursakhs, up the Kotul-i-Zilan, a long, easy, slope. Thence, by easy descent for 2 fursakhs, to Aughaz, 100 houses (Koochan).
Aughaz	3¼ "	5¼ fur.	.. ..	Thence ½ long fursakh to Chappa and Shukarli hamlets in a glen running south, up to a high ridge. Thence over downs ½ fursakh to Killa Sapur, and ascend an easy ridge. Thence ½ fursakh to Kurun, 40 houses, and descending narrow, easy, glen, enter plain of Koochan, at 8 fursakhs. Thence ½ fursakh to Darband-i-Hissar, ½ fursakh to Khabushan, old fort of Koochan, and 2½ fursakhs to Koochan.
Koochan	6 "	11¼ "	.. ..	Route said to be very easy. It is the one usually followed by the Kurds of Koochan in their raids against the Akhal.

ROUTE No. 14.

BUJNURD TO KARA KALLA, KIZIL ARVAT.

STAGES.	Distance.		Rivers, Passes, and Villages.	GENERAL DESCRIPTION.
	Miles, &c.	Total.		
Mana	6 fur.	..	.. .. Germekhan stream, 6 fur.	North-west over spur of Kuh Akhir, north of Bujnurd, to the banks of the Germekhan tributary, over a difficult hill-path, practicable for laden mules only. Mana is a large village of 400 to 500 houses, including the neighbouring hamlets.
Peshkalla	3 „	9 fur.	.. ..	Following down the course of the Germekhan, which flows through low undulating hills.
Karai	7 „	16 „	.. ..	From Peshkalla, north, leaving the Germekhan Valley, to Kalta Chenar, site of a large village now deserted. Thence west to Karai, also a ruined village. Road said to be easy. NOTE.—From Karai two roads pass over the spur enclosing the Germekhan tributary to the north, both described as very difficult, though the one to the west was passed by the guns taken with the force under the Saham-u-dowla to Kara Kalla.
Chandir stream ..	6½ „	22½ „	.. .. Ab-i-Sunt or Soont stream	The western road ascends the spur at a point known as Geuk Kamr, and crossing it, descends in a north-westerly direction into the valley of the Chandir tributary. Thence passes north over low hills presenting no difficulties, crossing the Ab-i-Sunt tributary of the Atrak and skirts the west spurs of the Sunt Sur Mountain to Kara Kalla.
Kara Kalla	6 „	28½ „	.. ..	The eastern road passes north from Karai, is slightly shorter, and more difficult, but is passable for horsemen. It crosses the Chandir tributary at a point 4 farsakhs above the western road, where are the ruins of a fort known as the Kalla Doduk, and

				thence runs north-west to the Ab-i-Sunt, and over the Sunt Sur Mountains to Kara Kalla, 11 fursakhs.
Kizil Arvat	10 fur.	38½ „	.. ..	Thence to Kizil Arvat is a distance of 10 fursakhs, 7 to the Atak, by a difficult road skirting the Dasht, a high plateau extending along the south slope of the outer or Atak range for some distance and reaching down to the banks of the Ab-i-Sunt, and passing at 2 fursakhs some ruins known as Khoja Mohalla. The descent to the Atak is said to be easy and practicable for light guns. From the foot of the hills to Kizil Arvat is 3 fursakhs north-west across the plain. From Khoja Mohalla, or Mohallusa, a road passes north-east to Bami Burma, 7 fursakhs distant, in the Atak.

Route No. 15.

BUJNURD TO DORAN, KARAGHAN, AND KELAT-I-NUR VERDI KHAN IN "ATAK."

.. ..	..	..	Gemekhan stream, 2 fur.	From Bujnurd due north to the Germekhan tributary, 2 fursakhs.
			Moujah Pass.	Thence a foot-path strikes off due north over the higher spurs of the Atrak watershed, and gaining the Atak by the Dihana or Pass of Moujah, 1 fursakh beyond which lies the Kelat of Nur Verdi, the leading Aksakal of the Tekkeh of Akhal. The bridle-road follows the stream south-west for 3 fursakhs, and then strikes off north over a low portion of the spur into the plain or plateau of Harar; traversing which and crossing a high spur
			Ab-i-Sunt.	into the Ab-i-Sunt Valley, it passes at 16 fursakhs the ruins of
Dadyana	16 fur.	..	Abzar Pass, 21 fur.	Dadyana. Thence a road goes north to the Dihana or Pass of Abzar, 5 fursakhs, and one fursakh across the plain to Doran
Doran	6 „	22 fur.	.. ..	and Karakhan (or Karaghan). Another turns towards the east to the Dihana Moujah, 8 fursakhs, and thence to Kelat-i-Nur Verdi Khan. Both roads are said to be passable for laden mules.

ROUTE No. 16.

BUJNURD TO GURGAN AND ASTRABAD.

Stages.	Distance.		Rivers, Passes, and Villages.	General Description.
	Miles, &c.	Total.		
Simalghan*	7½ fur.	..	.. ..	From Bujnurd, west, across a spur of Akhir Kuh, over a good road, to Simalghan, a collection of 8 or 10 villages, with 400 to 500 houses, lying in a fine plateau, which stretches west for 8 or 10 fursakhs.
Rabat-i-Karaguez	8 ,,	15½ fur.	.. ..	West and south, 32 miles, to Rabat-i-Karaguez or Karabil, an old caravanserai of the time of Shah Abbas, on a plateau draining to the Gurgan.
Chanda Abbas ..	4 ,,	19½ ,,	.. ..	About west to Chanda Abbas and Arghut, depopulated places on the same plateau, near its western edge. On the hills to the north lie Karagifan and Shah Abbas (which appears as Shahbaz on many maps).
Gurgan	7 ,,	26½ ,,	.. ..	West, at 2 fursakhs reaching the defile known as Dihana-i-Gurgan. This defile is described as narrow and shut in by precipitous hills; and from a distance it has this appearance, but the road is good, and might be made passable for guns. A wide road, cut by Shah Abbas, is now buried in dense forest. From the defile to Gurgan in the plain is 5 fursakhs, following the stream, which rises below the defile. At Gurgan are camps of Goklan.
Gumbuz-i-Kaus ..	8 ,,	34½ ,,	.. ..	Thence, following along the high banks of the Gurgan, west to the Gumbuz-i-Kaus, a tower in the plain, where are ruins of a city and camps of Goklan.
Findarisk	6 ,,	40½ ,,	.. ..	Across Gurgan Plain, west, to Findarisk, a large village on the skirts of the belt of forest, and in the district of Astrabad.
Astrabad	9 ,,	49½ ,,	.. ..	Thence to Astrabad, 36 miles, 9 fursakhs.

Route No. 17.

JAJARM TO ASTRABAD BY NOWDEH.

Jajarm	30 miles	..	Iwar, 7 miles, 50 houses. Durra, 9½ miles. Murtaza Ali Maidan, 18 miles.	North-west across plain and hill-skirt broken by ravines. Road fairly good. At 7 miles Iwar, village of Jajarm, 50 houses. Thence west through broken, hilly country, cultivated. At 9½ miles pass village Durra. Thence through uncultivated, open glen, enclosed by low easy hills. At 13 miles glen branches. Left branch bearing south-west leading into the Bostam Plain at village of Moghz. Follow right branch W.N.W., narrow and winding, hill-slopes easy. At 10 miles bear west, and at 18 miles reach open plateau, draining from north and south, opening south on the Bostam Plain, distant 3 fursakhs, and known as Murtaza Ali Maidan. Cross plateau west, and at 21 miles enter glen. Two miles to the right a mule-path leads over the hills to Kalposh and Gurgan in the Gurgan Plain. At 23 miles pass through narrow defile between masses of trap-rock known as Sang Surakh, and by easy ascent reach a plateau, broken by low hills. On north and at 27 miles bend west to Nardin, and descend into basin 6 or 8 miles, by 3 or 4, surrounded by high mountains, towards the west end of which lies the fort of Nardin, a small mud-walled enclosure with high thin walls and circular bastions, defended by three light field-guns. Supplies scanty. Road good. Except for half mile at the Sang Surakh Pass, guns might be driven to Nardin, and at that point a little labour would render the path practicable. No water save a brackish spring at Sang Surakh, after leaving the village of Durra.
Kanchi	23 miles	53 miles	.. ..	Leaving Nardin fort cross open plain west for half mile, thence W.N.W. to foot of hills at 6 miles. Thence up rugged hill of limestone and trap over fair bridle-road, with easy ascent to

ROUTE No. 17.—*continued.*

JAJARM TO ASTRABAD BY NOWDEH.

Stages.	Distance. Miles, &c.	Distance. Total.	Rivers, Passes, and Villages.	General Description.
			Nardin Pass, ascent 1500 feet, descent easy. Tulbin, 50 houses, Nowdeh stream.	crest of ridge at 5 miles. Ascent 1500 feet. Thence easy descent into glen leading down to valley of Nowdeh, tributary of the Gurgan. At 8 miles reach stream; village Tulbin, one mile right up stream. The ascent and descent of this pass are both easy. Thirty guns were taken over it by the Sipah Salar some years ago; they were dragged, but with a little labour might have been driven. The hill-side is of friable traps, and trap tufts of soft clays and marls.
			Gulistan, 11 miles. Chinask, 200 houses. Descent to Poursian, 2800 feet.	Follow Nowdeh stream south-west; the road good, and keeping above and to the right side of stream. Hill-side soft. Guns might follow bed of stream, or road, if widened in parts. At 11 miles pass village Gulistan, 30 houses. At 13 miles pass village Chinask, 200 houses (with hamlets), on hill-side above stream, left. Through Chinask lies a road over a high shoulder of Khushyeilak Mountain to Bostam, by which guns have been brought to Nardin. At 21 miles valley opens out and bends west. A stretch of well-cultivated ground, half mile in width, extends thence to 23 miles, where on a sub-tributary from north-east is Kanchi Poursian, one of three hamlets known collectively as Poursian, consisting of 50 houses. Supplies ample.
Nowdeh	19 miles	72 miles	.. ..	Cross Kanchi glen and spur of opposite hill, and at 1 mile strike Nowdeh stream, and bear west Khushyeilak Peak bearing S.S.W. Valley open and cultivated. Road narrow and stony along right banks. At 11 miles across small stream of Alaru

			Nowdeh, 1600 feet.	from village Ahre, at head of a glen in mountains to left. Thence valley narrows and bends, north banks of stream high, and covered with heavy forests of oak, elm, alder, and other deciduous trees. Forest-clad slopes of mountains on either hand, reach banks of stream. At 17 miles valley again opens out to 1½ to 2 miles in width, and is cleared and cultivated. Keeping left side of valley, at 19 miles, reach village Nowdeh, 50 houses. Supplies ample. Between Nowdeh and the Gurgan Plain a few isolated hills, and 4 or 5 miles of dense forest and cane-brake intervene. The forest is traversed only by narrow winding paths. Between Kanchi and Nowdeh some labour would have to be expended in clearing a road through the 6 miles of forest that must be traversed, but the route presents no other difficulties.
Ramian	12½ miles	84½ miles	.. ..	W.S.W. from Nowdeh through dense thickets of undergrowth scrub, covering deserted clearings. Path narrow and winding. At 2 miles enter heavy forest, free of undergrowth. At 9 miles reach foot of wooded spur, ascent and descent of half mile, very steep. Thence through open forest west into the glen of Ramian, a large village of 200 houses, in a gorge opening on the Gurgan Plain, but separated from it by some miles of forest and cane-brake.
Katul	22 miles	106½ miles	.. ..	West from Ramian through scattered patches of forest and dense cane-brakes. At 11½ miles reach Findarisk, chief village of the district, of 1000 houses with surrounding hamlets, lying near the edge of the submontane belt of forest. From Findarisk to Nowdeh there is a direct road, shorter and easier, but crossing for some distance the open plain. The Ramian route is only selected for safety. From Findarisk bear W.S.W., and at 14 miles pass Maintalu in the forest on the edge of the plain. At 15½ miles cross small stream Odarush from hills left. Dar Killa, 200 houses, half mile left. Country open and cultivated to base of hills 7 to 8

ROUTE No. 17.—*concluded.*

JAJARM TO ASTRABAD BY NOWDEH.

STAGES.	Distance.		Rivers, Passes, and Villages.	GENERAL DESCRIPTION.
	Miles, &c.	Total.		
				miles distant. At 16 miles enter forest, and bear north-west. At 18 miles cross wide, gravelly bed of stream, from Ahre, impassable at times in early summer. Thence through forest clearings, 22 miles to Katul, large village of 400 houses. Supplies procurable.
Astrabad	25 miles	131½ miles	.. ..	Bear west across cultivated plain and scattered forest to Pechuk Mahallah, 3 miles. At 12 miles enter heavy forest, and at 14 pass ruined village, Ganara, in forest. At 16 miles still west reach Nomdeh, village of 200 houses. Thence west through scattered cultivation, forest, and plain covered with dense scrub of thorns, 13 miles, to Astrabad.
				Track for the most part good, but narrow and heavy from recent rain.
				NOTE.—By striking across the plain from Astrabad, Nowdeh might be reached in two long marches, for the most part over open ground.

Route No. 18.

NARDIN TO KIZIL ARVAT.

Kalposh	3½ fur.	..	.. ..	From Nardin north-east into the Kalposh plateau.
Chanda Abbas ..	8 „	11½ fur.	.. ..	Thence E.N.E. to Kalyun Durra, and descend north into the plain of Dasht, traversing which, at 8 fur., Chanda Abbas is reached. Road good and passable for guns.
Karat	10 „	21½ „	.. ..	From Chanda Abbas across plain for 3 or 4 miles, passing Yaghi Oghan on hill-skirts (depopulated), and thence over high spurs of Korkhud Mountain to Karat, at west end of plateau of Simalghan.
Kari	6 „	27½ „	.. ..	Descend north into valley of the Germekhans tributary, and cross stream at Chihl Guzr, thence 4 fursakhs to Karai. Road passable for light guns. From Karai as in Route No. 14.

Route No. 19.

NARDIN TO GURGAN.

Kalposh	3½ fur.	..	.. ..	North-east from Nardin.
Gurgan	8½ „	12 fur.	.. ..	North and west from Kalposh over the outer range of mountains into the Gurgan Plain, and across the plain for 8 or 9 miles. The 30 guns taken by the Sepah Salar to Gurgan were dragged by hand on their carriages, over the Range of mountains dividing Kalposh from the plain.

ROUTE No. 20.

GURGAN TO ATRAK (RIVER).

Stages.	Distance.		Rivers, Passes, and Villages.	General Description.
	Miles, &c.	Total.		
Khalid-i-Paighambar	8 fur.	..	.. ..	From Gurgan west, following stream for a few miles, thence north, across an undulating plain, and over a low ridge dividing the two rivers, to Khalid Paighambar, an Imamzada, on an isolated hill.
Chat-i-Atrak ..	3½ „	11½ fur.	.. ..	Thence across the plain to the junction of the Ab-i-Sunt and Chandir, tributaries of the Atrak, known as the Chat-i-Atrak. The whole line is described as broken and difficult ground, much cut up by ravines.

ROUTE No. 21.

ASTRABAD TO ATRAK.

Gurgan River ..	3 fur.	..	.. ..	From Astrabad to Ak Kalah north-east, for 2 fursakhs, crossing at 1½ fursakh the Kara Su stream, thence 1 fursakh to the Gurgan.
Atrak	7 „	10 fur.	.. ..	From the Gurgan about north to the Atrak, across which lie the Atrak pastures, extending from Hasan Kuli on the estuary of the Atrak, for 2 or 3 fursakhs up stream.

Route No. 22.

HASAN KULI TO KARA KALLA.

Byat-i-Haji	12 fur.	..	.. ..	From Hasan Kuli, a settlement of Ogurjilly Turkomans, on the north shore of the Atrak estuary, to the Atrak pastures, 2 fursakhs. Thence along bank of river to Byat-i-Haji Olang (pasture), 12 fursakhs.
Chat or Chat-i-Atrak	10 „	22 furs.	.. ..	Along bank of river to junction of the Germekhans, the main tributary with those from the north.
Chat-i-Chandir ..	7 „	29 „	.. ..	Along the banks of the Chandir, or north tributary, to the junction of the two main branches from the Atak Range, Ab-i-Sunt and the Chandir, rising in a plateau known as Charik-Olang.
Kara Kalla	10 „	39 „	Sungdagh.	North of the Chat-i-Chandir is the Sungdagh, a range of hills said to have many springs and fine pastures. Its spurs reach to the banks of the river. Thence following the Ab-i-Sunt tributary, flowing through open plateau, for 8 fursakhs, turn off north to Kara Kalla, up a steep ascent over spurs of the Sunt Sur Mountain.

V.—*Notes of a Journey from Hankow to Ta-li Fu.* By the late AUGUSTUS RAYMOND MARGARY, being Extracts from the Author's Diary.

[*Read*, February 14th, 1876.]

[The Government of India having signified a desire to send a small Mission into Yun-Nan, a passport was obtained in the summer of 1874 by the British Legation from the Chinese Government, to enable four officers and gentlemen, with their followers, to cross the frontier from the Burmese side. Mr. Margary, a young member of the China Consular Service, of great promise, was sent with a separate passport from China to meet the above Mission, which had been placed under the leadership of Colonel Horace Browne. Having joined Colonel Browne at Bhamo, the Mission had entered China, and was but a short distance from Manwyne, when Mr. Margary pushed on to that town. He had passed a week in it on his journey southward. At Manwyne he was murdered on the 21st of February. An attack was made on the following morning on Colonel Browne's party, which, however, after a sharp struggle, was enabled to draw off without serious loss. Mr. Margary, in compliance with his instructions, kept a journal; but the following portion of it, recording his experiences as far as Ta-li Fu, is all that was saved. There are various gaps in it, to be explained probably by the fact that he suffered from time to time seriously in health. The remainder was probably with him when he was murdered.]

HAVING received orders, while at Shanghai, to hold myself in readiness to proceed to Yun-Nan at a short notice, I set myself without delay to make such preparations as would enable me to start with dispatch, yet at the same time without definitely incurring an outlay, in case of a countermand. The above intimation was received through Mr. Medhurst, on the 9th of August; and on the 15th and 21st, I had the honour to receive full and confidential instructions from H.B.M. Minister, which directed me to start at once, and accordingly I left Shanghai on the night of Saturday, 22nd of August, for Hankow.

Aug. 28*th*, 1874.—Reached Hankow in exceptionally hot weather, and unfortunately in a very bad state of health, which continued for several days, and retarded my final preparations. Mr. Consul Hughes had called upon the Viceroy with the letter from the Tsungli Yamen, and found his Excellency had already received despatches from Peking on the subject of my trip. The Viceroy, in conversation, strongly recommended the Hu-Nan and Kwei-Chou route as that which was usually followed by officials, and was just now selected by the Governor of Yun-Nan, who was on his way thither. Acting on this advice, and moreover finding that time and expense were likely to be saved by adopting this road, I decided to do so. The Viceroy directed all the officials along the route to aid and protect my progress.

My preparations were completed for starting on the 3rd, but unfortunately an attack of illness obliged me to put off the departure till next day. The boat was one of those commonly called a Mandarin boat, long and narrow, and divided into five or six compartments which ran the whole length of the craft, the centre being occupied with a somewhat wider and neater space, fitted with chairs and tables, and suited for the reception of guests. Each compartment contained a couple of low berths, one on each side of the passage running down the middle. But as a Chinaman's average stature falls far short of an Englishman's proportions, I found it necessary to lengthen the bedside of my compartment by removing the dividing panel. A similar precaution had to be taken with regard to the floor, whereof the boards were lowered fully six inches to save my head from the pains and penalties of trying to unroof the not too substantial top. A regular Chinese form of agreement was drawn up by the boat-owner and handed over to me. The main conditions were that he should convey me to Chen-yuen Fu in Kwei-Chou for the sum of 110,000 cash, which was to be paid in several instalments at different places on the way, starting with a prepayment of 60,000 cash at Hankow. This sum was to include everything, and to free me from all those incidental appeals on behalf of the crew which so frequently spring up *en route* to delay and annoy the traveller. My party consisted of five, comprising a writer, an official messenger, a cook, and my body servant. With regard to the necessary supplies for daily expenses between Hankow and Yun-nan Fu, where alone I had credit for funds, I should mention that I adopted the following plan which appeared to be the best that anyone could suggest. It was to take with me in the boat a quantity of cash sufficient to cover everything as far as Chen-yuen Fu, and to leave a margin wherewith to pay the first instalment for chairs in the land journey, which would commence at that place. In addition to this I procured a hundred taels' worth of small silver ingots, weighing five taels each, which formed a very convenient parcel, and one easily concealed in a box of winter clothes reserved for Yun-Nan. These small ingots are called at Hankow *chin sha yin*. The cash was entrusted to my official messenger, whose receipt for the amount relieved my mind of the monstrous anxiety of having to watch over the safety of what seemed a vast hoard when converted into the bulky proportions of copper currency. The whole mass was deposited loosely in strings of 1000 cash (called a *tiao*) on the floor of the boat, beneath the servant's couch, and there it might remain without the smallest fear of theft, although within easy reach of a pilfering arm.

Sept. 4th.—Left Hankow at 11 A.M.

6th.—Tracked against a south wind all day. Country flat and dry, cultivated with cotton and sesamum. Only made 45 li, and anchored at P'ai-chou, in company with a number of river-junks. Left the boat and walked across a bend to the village of P'ai-chou, which looked exceedingly pretty, embowered in masses of trees. On a nearer view the village expanded into a large straggling town, full of well-built, substantial houses, which spoke of considerable prosperity. My writer and messenger were with me. We met with civility at first, and sat down at one house chatting with the host. But as we passed the quarter by the junks the wildest excitement broke out. A mob collected and followed me for fully half a mile along the bund until I found my boat. It was not very exhilarating, and I confess I failed to enjoy the fun as much as the rest, for they snouted and screamed with laughter, dancing round me as if they were intensely amused.

8th.—Got over 60 li to Hu-hsin Chou, an island in the big river, separated from the mainland by a narrow channel, which afforded a good anchorage to boats passing up. The district city of Chia-yü Hsien was only removed a few li from this spot, and appeared to be well placed among low hills and a quantity of trees. The island itself was thickly covered with sand hidden by luxuriant growth of a grassy weed, which deceived the eye at a short distance with the appearance of a meadow. The heat was very great all day.

9th.—Tracked all day against wind and stream, arriving among the hills. Stopped at Lu-ch'i-k'ou, 60 li from the last stage. Here a clear mountain-river flowed down from the Tea Hills, and went to pollute itself in the muddy bosom of the Yangtsze.

11th.—Reached Hsin T'i, a flourishing place, with a great number of river-craft massed in the open, unsheltered anchorage which faced the long, straight frontage of the town. A *tao-t'ai* was established on the bank of the river, whose sole duty it was to collect the timber-dues from the rafts which float down in large numbers. These rafts present a very curious appearance. Seen from a short distance they look like a floating village with a brisk population, and on a nearer view one cannot help admiring the ingenious construction. The larger lengths of timber are closely massed together, forming a compact raft of no mean dimensions, down the centre of which are constructed a series of neat huts for the crew to live in. The head of the raft is shaped off to somewhat of a sharp prow, and at the stern a gallery runs out fitted with steering apparatus. The fast stream of the Yangtsze carries them down with sufficient speed,

but they are also furnished with enormous sweeps, requiring the strength of ten or twelve men to manipulate. The raftsmen appear to possess a magnificent form. I have nowhere seen such fine athletic frames in China, and could not help stopping to admire the splendid development of muscle, which was so well displayed as they swayed to and fro with the enormous sweeps. It may be worthy of remark that I noticed, first at P'ai-chou, and repeatedly afterwards at other places further up the river, the use of a cart in agriculture. It is not often that one sees a Chinese farmer make use of anything so handy; but, in this instance, the form of the vehicle was so novel and so different to that which is sometimes used in the Province of Chih-Li, that it deserves to be described. The diversity of shape is itself a striking fact in a country where similar operations are carried on in precisely the same way and with the same implements in provinces far apart and disconnected by dialect. The main difference lay in the fact that whereas the northern carts, like others all the world over, are built with their wheels outside the body of the vehicle, the centre of gravity of which is placed low down, these Hu-Peh carts enclose their wheels, and are consequently raised high above them, like a railway carriage. The cart simply amounts to a wide platform poised above two wheels upon the stout axles which protrude. Dragged along by the water-buffalo, of all beasts the most ungainly, its appearance is more quaint than elegant.

12*th.*—At Lo-shan I deemed it prudent to call on the local official. Having announced my intention of calling at 4 P.M., I waited through a very hot day for the welcome diversion. But I was little prepared for the hubbub my presence was going to create. Lo-shan had never been feasted with even the sight of a foreigner, and their very ignorance of his conformation put a boldness to the curiosity of the mob which surrounded me with shouts and abusive language as I proceeded in a hired chair, the meanest of its kind, to the poor abode of the local official. As is usually the case in China, the rabble burst into the courtyard of the yamên, and were with difficulty repressed from filling even the audience-room, by the whips of the lictors at the door, who plied their arms with a will. An interview is never private in China, any more than correspondence. It is not considered indecorous to take up any written document, whether intended to be confidential or not, and to read it calmly through. I have seen a Mandarin, while making a call on the Consul, step up to the writer's table, and, coolly putting on his spectacles, read a letter which had just been prepared for another official on an important subject. So, too, every interview I have

had the honour to assist at, has been swelled by the presence of a number of idle spectators. I found the official in question to be a very civil and obliging man, well informed and well disposed towards foreigners. He was reading a book written by a Chinaman of rank, named Pin, who some years ago had been sent to Europe to record his impressions of foreign countries, and subsequently published the volume referred to. Calling my attention to the book, he frequently remarked that England must be a fine country. On taking leave I complained of the conduct of the people, and the officer immediately ordered a couple of his men to escort me back, but their efforts were barely equal to repressing the excited crowd which followed us to the boat, and stood in a dense mass round my chair. The best way of pacifying a Chinese mob is by talking to them, and showing them at once that you are familiar with their language and literature. Accordingly I addressed a few words to my aggressive audience, which had the almost immediate effect of quieting and dispersing it.

13th to 19th.—Lo-shan proved to be an exceedingly pleasant place to stop at. A stretch of downs surrounded the town, and afforded us both exercise and sport. I was able to take many a walk free from intruders, and, by permission of the Mandarin, I shot over some excellent cover. Immediately behind these downs extended a flat plain as far as the eye could reach, cultivated with rice and the lotus. This is a great lotus district, and a very curious special industry has grown out of it for the people of Lo-shan. It appears that the art or knack of extracting the kernel of the lotus-nut from its hard shell is only properly understood at this place, and the produce of the whole district is sent to Lo-shan, whence it is distributed in its edible form up and down the river. The view across the river, which was here fully a mile and a half wide, . . .

20th.—Started at 11 A.M. with a strong breeze from the north-east, which accelerated our progress, but struck me down with fever. We sailed for the celebrated island of Chün-shan, which lies at the entrance of the Tung-ting Lake, opposite the city of Yao-chou, and some 30 li away from the latter. Here we took leave of the muddy Yangtsze, and entered into cleaner waters of a pale-green hue.

21st.—The wind continuing favourable and strong, my boatman took the unusual course of sailing straight across the lake instead of creeping along the shore. We actually accomplished 180 li at one stretch, and entered the river at 9 P.M. The lake is extremely shallow, and seems to be very little used, for I only saw one or two junks during the day. We anchored at a place called Nan-chai.

22nd.—Sailed up the Yuan River with a good breeze until we arrived at a considerable town stretching along the face of the river, called Ni H'sin T'ang, 60 li from the mouth. After remaining half an hour to procure provisions, we proceeded on our way. The scenery of the river is exceedingly pretty. In lieu of bare towing-paths and muddy deposits, which invariably meet the eye in many parts of China, here I was delighted to find grassy banks covered thickly with willow-trees. I landed and walked as far as my weak state permitted. Everywhere the signs of prosperity abounded. There was neat and careful cultivation of cotton. The homesteads adjoining the little farms were well built and well provided, and men, women, and children seemed to be happy and thriving. I met with civility from all. Stopped for the night at Yin Ho Hsiang, having run over 100 li from our last halt.

23rd.—Passed Lung-yang Hsien, at a distance, by 11 A.M., and stopped at Liao Ya Tsui, only 70 li in advance.

24th.—We stopped at Shih-ma P'u, 20 li from Ch'ang-tê. Only progressed 40 li. About midway we came across a small tributary river, which does not appear in three several maps which I possess. I am told, however, by the boatmen that this river communicates with Sha-shih, on the Yang-tsze, and also with Tseng-shih and Li-chou.

25th.—Reached Ch'ang-tê, and had a fine view of the city as we passed along its face on the opposite side of the river. The wall of the city, as I observed after we had crossed over, was built very close to the river-side, leaving no room whatever for an open suburb to spring up outside, which was absolutely necessary for the carrying on of trade. The difficulty, here, has been got over by building wooden tenements on long piles, embedded in the very mud of the sloping bank. The result is an exceedingly odd appearance of houses walking on long, crooked legs and leaning at all angles.

We crossed over to the city, and I sent my card to the Prefect. I had scarcely dismissed the messenger before a boat came alongside, and a Mandarin, wearing a red button, stepped into my boat. Not being prepared to receive him, I hastily retired to rearrange my dress; but my visitor insisted on my making no change, shook hands with me, and said that the Prefect had especially deputed him to attend upon me, and that he should accompany me to the next Prefecture. He stayed upwards of an hour and talked incessantly. After he left, I was somewhat annoyed by people coming down to stare. In some cases they would step on the side of the boat to look in through the windows. It was the great full-moon holiday, and a number of idle characters were about. No direct rude-

ness was offered, however, although the crowd showed itself inclined to be "larky."

27th.—Left Ch'ang-tê.

28th.—By 2 o'clock reached T'ao-yuen Hsien, a large and flourishing city. The whole frontage of the town was stored up with earthenware water-jars and glazed flower-pots. The place was a depôt for the pottery trade, and large quantities of the above ware was passed on from the T'ao-yuen Hsien to Ch'ên-chou Fu. It is the most lawless, independent district in the whole province. The people if roused by a sense of injustice or misrule would not hesitate to carry off their Chief Magistrate bodily to the Governor's capital and demand a change. Since this morning we have been entering mountain scenery of a very beautiful and attractive kind. Everywhere vegetation seemed to spring up in abundance. Pines covered all the hill-tops, and several stout trees of the ash kind seemed to exist below. I even came across two palms. We stopped for the night at Shui-ch'i.

29th.—Li-pi-shêng, the Mandarin who has accompanied me from Chang-tê, I have found an exceedingly agreeable companion. He was one of Li Hung-ch'ang's right-hand men in the wars of the rebellion, and had been successively rewarded with a number of lucrative posts by that powerful chief, whose confidence he still boasts of possessing. In 1864 he had an appointment at Shanghai, where he acquired a liking for Europeans, which appears to have remained unimpaired. Of course, he trusted very much in my being able to give him a helping hand, by reporting his diligent attention and civility to me, in my letter to H.B.M. Minister at Peking. Since this morning we entered upon a complete change of scenery. The river, with its beautifully clear water, was considerably narrowed, and began to wind in and out between fine rocky gorges. The rocks rose perpendicularly in a triangular shape out of the shallow waters at their base, with a grandeur which was most impressive. The whole of Hu-Nan is an exceedingly good field for geological examination.

On arriving at our resting-place for the night, I was very much surprised to see a small boat of the very commonest class come alongside, and a couple of disreputable-looking rascals emerge from it with the card of the T'ao-yuen Magistrate in their hands. He had sent them to escort and protect!! me as far as the next magisterial city. Nothing is done thoroughly in China; the Mandarins look to their tenure of office as the golden opportunity for feathering their nests. So our worthy friend carried out his instructions as cheaply and as nastily as he was able on this occasion. He despatched a couple of dirty

scullions, or some other such menials, out of the needy crowd that infests all Yàmeng, hoping, no doubt, that fine words and the foreigner's ignorance would hide his devices.

30th.—Li Pi-shêng left me next day, and I was now consigned for "safe conduct and protection" to the care of the two miserable menials in their ridiculous boat, whose frantic efforts to keep pace with us afforded me much amusement.

At about 3 P.M. we passed through several rapids in succession. There was nothing formidable about them. Five men tracked along the shore, and the remainder staved the boat off sunken rocks with their bamboo poles. The scenery was wildly beautiful, and more compact than that we passed through yesterday; a continuation of perpendicular cliffs now and then lined the river-side. A mountain-path, which was the highway for foot-passengers, passed in some places along the very face of the upright cliff.

October 1st.—We passed through the most dangerous set of rapids on the river. They extend over 30 li, and are divided into three portions of ten li each by the boatmen, who name them the upper, the middle, and the lower. In these rapids solitary rocks and rugged ledges appeared everywhere in such profusion that it seemed impossible for a boat to be guided through in safety. The labour was great, but they accomplished it with great skill and success, until we had reached half-way across the middle set of rapids, when a violent collision with a rock produced a leak, which compelled them to pull up at a timber-station that happened to be near, and spend half-an-hour over repairs.

The small village we stopped at to make repairs was a very flourishing timber-station. The hills at the back were well covered with fine fir-trees, and a mountain-stream flowed down from their inmost recesses, facilitating the transfer of the timber from these backwoods to the main stream.

2nd.—This morning I had the misfortune to be completely prostrate with a severe attack of dysentery, accompanied by acute pain, which lasted for some hours. I was obliged to stop the boat for four or five hours, in order to ascertain the course which the malady was likely to take, harassed all the time with the thought of being compelled to relinquish my mission and return to Hankow crestfallen. However, to my great relief, the disease was quickly and completely driven away by opium and ipecac. pills, the efficacy of which, in the early stage of this malady, I can thankfully vouch for. Although cured, I was left so utterly weak as to be unable to rise without assistance.

On *October 3rd* reached Ch'ên-chou Fu; and on the 5th passed a dilapidated city called Lou-ch'i Hsien, and at 5 P.M.

arrived at Pu-shih, formerly the flourishing centre of the timber trade, but now reduced to insignificance by its treatment under the rebel raid.

On October 6th just stopped long enough to exchange cards with the Mandarin and buy what provisions were procurable. The extreme difficulty of buying food has been a continual trouble to me the whole way. Fowl and duck are the only things to be had, and in many places even these are not to be bought. Any European who attempts this route should provide himself with foreign provisions. At Ch'ên-ch'i Hsien the river takes a most remarkable and provoking bend to the south of over 200 li, and then flows north until, reaching the line of its original course, it bends to the west again. This deviation forms a complete sack in appearance on the map, and adds greatly to the tediousness of tracking through innumerable small rapids.

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[Diary missing.]

27th.—Reached Ch'ên-yuen Fu at 5 P.M. At the entrance of the city a good bridge of five or six arches, which would not disgrace a railway in England, spans the river. Rocky heights completely surround the town, and lend a grandeur to its position. The gorge of the river for the last mile of our approach was very picturesque. On one side the rocks extended with such even regularity that they looked like the ancient walls of some Titan city.

28th.—Left the boat and commenced the land journey. It rained the whole day, and the high road, which was a narrow, ill-paved path, became dangerously slippery.

29th.—Arrived at Shih-ping Hsien, where I went straight to the Magistrate's yamen, and was well rewarded for my visit. An exceedingly agreeable and gentlemanly man the Magistrate proved to be, and, in the course of half-an-hour, we became great friends. He begged me to stay and spend the day with him, but I was obliged to excuse myself on the plea of extreme urgency to continue my journey.

30th.—The road was fortunately dry next day. The sure-footedness and endurance of the chair-bearers, who had frequently to carry my weight up long, steep inclines and down precipitous paths, in which the stones were so irregular that I could not have walked down myself with their speed, often fairly astonished me, although I had been frequently carried over far worse places in Formosa in a similar manner. Two men bore the front shafts of the sedan, and one alone with a long leverage of poles sustained the weight behind. At a distance of 30 li I reached Hsin-chou. There being no resting-

place ahead which could be reached to-day, I readily accepted the hospitality of a very civil Mandarin, with whom I had a most amicable conversation. He was a Canton man, and had both seen something of foreigners and travelled by steamers.

31st.—The road passed at a very high level for nearly the whole of to-day's stage. The valley below seemed to be sparsely cultivated with rice, and large tracts of land remained in a wild state of nature. Slept at a place called Ta-fêng T'ung.

Next day we reached Ch'ing-p'ing Hsien, and on leaving the town I noticed a large heap of good coal exposed for sale, which clearly indicated the existence of mines in the neighbourhood. Every village I passed through showed sad signs of the savage havoc caused by the raid of the Miautsze. Everywhere extensive remains of good, substantial stone houses pointed out the prosperity that must have been, and in their stead twenty years of peace and quiet had only produced a huddled group of poor, straw-thatched huts, inhabited by immigrants from Sze-Ch'uen and Kiang-Si. Curiously enough, there are signs of a sudden impulse of prosperity now taking place, for in every village, town, and city, new houses were either just finished or in course of construction.

On *November 2nd*, the road passed through a very fertile and beautiful, but wholly deserted, region. Large tracts of good arable land were given up to grass and wild weeds. This fact alone speaks very plainly of the wide-spread desolation, when we consider how accustomed the Chinese are to cultivate their very mountains up to almost inaccessible heights; and if the desolation is so great on the main road, what must it be in the less frequented interior? The Miautsze have been taught many severe lessons by the Imperial troops since their day of triumph; and, indeed, many of them now live in the cities I have passed through, mixed with the Chinese population. I saw several of their women about the streets. A wild, fearless look was in their faces, and withal a very attractive expression, such as I have seen in the countenance of the Pepohwan tribe in North Formosa. But whether thoroughly subdued or not, the settlers in the rising villages have little to fear from their lawless neighbours, for a chain of forts has been erected at distances of 5 li apart, each containing five soldiers, which serve as watch-towers, while the whole route is chock-full of soldiery.

3rd.—Just as the cities grow in size and start into more active life as we approach the capital, so the country becomes less neglected, villages appear in secluded hollows off the main road, and every level plot is cultivated with rice. One crop

has just been gathered in, and the patient peasant was everywhere engaged in ploughing up, with aid of the lumbering buffalo, the diminutive basins into which their paddy-fields are divided, and preparing the ground for a second or third crop. I noticed a few men threshing out the in-gathered grain with the very identical old flail which our farmers had to use before machinery drove it out of use. The only other object of cultivation which I could see anywhere was the tobacco-plant. At the end of 45 li, or say 15 miles, on 3rd November, we reached a city called Kwei-ting Hsien, which was, as usual, somewhat in advance of its neighbours in resuscitation. I went straight to the yamên, and was very civilly received by the Mandarin, who had been at Shanghai and Tientsin, and could not refrain from praising up everything that was foreign. We were to go on to-day a long stage of 65 li; so, in order to save time, I hurried away, thinking my baggage was well on its way. But what was my astonishment, on descending to the main street, to find the whole crowd of bearers in a regular mutiny. I had to get out and expostulate with them, surrounded all the time by fifty or sixty of the townspeople, who rather took my part, and were exceedingly civil. I was surprised to find that here, as elsewhere, all along the route, the Peking dialect was thoroughly intelligible, and that I could understand the people far better than I did in Hu-Nan. My expostulations resulted in the headman writing out a guarantee that they should carry me to the capital in exactly the same time under penalty of a heavy mulct.

4th.—In order to keep their promise, my troublesome carriers would have me rise unusually early, as they intended to "do" 75 li this day; of their accomplishing which I certainly felt very sceptical. However they did complete the long stage by 6 P.M., and I soon found myself in the yamên of the magistrate of Lung-li Hsien.

The road, for the greater part of the way to-day, passed through narrow ravines where the grass-clad hills approached very close, and no room for cultivation intervened. Thick hedgerows lined the highway, composed of what in other countries are forest trees, but here meanly doing duty as stunted shrubs. There were the oak and the horse-chestnut, of which I could not see even a moderately grown tree anywhere. Fine young Scotch firs were springing up everywhere, and crowning the hills with a fine deep green. Willows and ashes, sycamores and poplars (not the English kind) filled the lower slopes, and now and then I came across a magnificent Spanish chestnut. But the glory of the plain was the persimmon-tree, all ablaze with the brightest yellow autumn tint.

Wild flowers abounded everywhere, including the camelia, blue bells, marguerites (in splendid variety and profusion), and the violet. The whole road was a perfect paradise of ferns, and grasses flourished in marvellous variety.

5th.—To-day we have completed our last stage, and entered Kwei-yang, the capital of Kwei-Chou. I am delighted with the place. The people are most civil, and not in the slightest degree troublesome. The main street, through which I had to pass on my way to the inn where my servant had secured lodgings for me, was exceedingly picturesque, with its sign-boards and dyed cloths exposed for sale, and coloured umbrellas spread out to tempt the rain, with glittering red, or blue, or green. The first view of the city from the top of the last pass is very beautiful. It rests on an uneven plain, well-supplied with trees, and completely surrounded by high hills, many of which stand solitary on the plain in remarkable forms. There were natural fortresses faced with smooth, black rock at the top, otherwise clothed in rich vegetation, and which had been cleverly seized upon by bonzes to build imposing temples up in the air. The inequalities of the ground raised all the imposing buildings above the veil of the walls, which everywhere in China provokingly hide every vestige of a city from the traveller's approaching view. The last mile of the road was literally overloaded with memorial arches of white marble, or other substitute, in perpetual honour of maidens distinguished for piety, and widows constant to the memory of the deceased. Their distant effect certainly added to the liveliness of the scene.

I called on the Governor of the Province the next day, at noon, by appointment, and was most civilly treated by him. A brisk old man, full of energy and intelligence, entered the reception-hall, after I had waited about a quarter of an hour for him. It was a large room, and two sides of it were panelled with glass windows, through which I should think there were fully fifty faces peering in during my interview with the great man. There were lesser Mandarins in full fig, and a crowd of household servants. We sat midway up the hall, on opposite sides, more than 20 feet apart. A visitor of high or equal rank he would have conducted to the divan at the upper end of the room. My first object was to borrow money, which was readily granted; and the next morning a parcel of silver ingots, amounting to Tls. 130, or about 40*l.*, duly came to hand. On taking my leave, the great man did me the honour to conduct me to my chair. My time was completely occupied all the rest of the day in making arrangements to lighten my baggage and to travel more quickly. Being behind time several days,

I was anxious to get on as fast as possible; but I found it quite impossible to cut short my stay at the capital under two days, and I was further interrupted by incessant visitors, whose continual "coming" did not cease till midnight. I now determined to have nothing to do with carriers, but to put everything on horseback, so that no delay might occur from short fatigue stages.

Left the capital on the 8th, and on the 9th travelled 62 li to Chin-ch'i Hsien, and called on the Magistrate, who proved to be a somewhat jovial old man of 62. He had a very pleasant face, a very husky voice, and a chronic laugh tacked on to his words. I had the pleasure of receiving him later, after dinner, when he showed a liking for sherry, and tried to smoke a long pipe of tobacco, after trying both cigar and cigarette. The country was rather more colonised and cultivated than on the east side of the capital; but still vast tracts of level arable land, bearing distinct signs of former tillage, were completely deserted and covered with long grass. The villages on the main road are of a most miserable description, composed of huts built of the thick straw of the sorghum, and plastered with mud, or piled up with the stones and *débris* of former prosperity. I could not find a decent room wherein to breakfast, and sat in the open air under the wondering gaze of the whole population. But everywhere the people were amenable and well-behaved. It has been my habit to get out my writing materials whilst waiting for food, and the process always creates extreme astonishment. About midway on this day's route we crossed a very remarkable avenue of hills, extending in a straight line north and south for several miles, with a perfectly flat and narrow strip of fertile land between. Further on, the general direction of the valleys was east and west. Wild flowers filled the roadsides, and the tea-plant, in full blossom like a single camelia, grew wild all about the hedge-rows, developed untended into a strong shrub 8 or 10 feet high.

10th.—The whole route to-day passed through a fertile valley, perfectly level, and some 6 to 8 miles wide. The most remarkable feature of the province is its hills. I have above noticed the singular detached cones and pyramids which dot the plain of Kwei-yang Fu (which, by-the-way, extends north and south); but on leaving Ching-ch'i Hsien, a regular conclave of these huge tumuli meets the view of the traveller. I cannot call them mighty, as the highest does not appear to exceed 300 feet. After passing through them we entered the fine valley abovementioned. It was bounded in its whole length along the 80 li we travelled to-day by these same detached hills. They were not contiguous, nor in any way barred progress in between or

round them in almost any direction; indeed, long arms of the broad valley were seen to penetrate like estuaries through their midst. Far away in the southern boundary of the valley, where the hills seemed to be massed almost into a mountain range, the eye could still see similar separated peaks, which strengthened the presumption, that a very large belt of country was here both easily penetrable, and abounding in a complete network of small arable valleys. We reached the Prefectural city of An-hsün by six o'clock. The undulating, downy ground to the east of the city, *i.e.*, from the side we approached, was one vast graveyard, extending over two or three thousand acres. Either this must have been a favourite cemetery, or the population of An-hsün Fu must have been enormous.

11th.—Left An-hsün at about 9 A.M., and passed through the same scenery surrounding the rich valley above-mentioned. Cultivation increased as we proceeded westward, and large tracts of fine, rich soil were turned up to view by the plough. One thinks of Kwei-Chou as an impenetrable mass of mountains, but it was most agreeable to find it possessed of many fine plains lying in the right direction.

12th.—About 15 li from Chên-ning Chou, we came to the end of the fine valley, but entered another smaller one, after crossing an easy pass. In 10 li more the valleys came to an end, and the road wound in and out among low, grass-covered hills; the rocky, mountainous peaks having disappeared for the time being. We entered the village of Hwang-kwo-su, once a large town, over an old bridge of several arches, under which flowed a considerable body of water, after dashing down a series of small, sloping falls. On leaving the place, a grand sight met my view. There was the river, a couple of hundred yards below the bridge, leaping down a precipice of 140 feet in one of the prettiest falls I ever saw. The brown muddy look of the rock, over which the river flowed, added to the striking effect of the whole.

13th.—The damp, white mist, which has surrounded us for a day and a half, was to-day condensed into the still more uncomfortable form of fine rain, and the thick vapour floated low above the ground. It made travelling both difficult and dangerous; for the stone-paved, or rather stone-strewn, track was provokingly rough in itself, but to-day, for fully 10 miles, we passed a mountainous barrier, over which the road ascended and descended somewhat steep inclines. But even in the midst of this mountain mass, where the rocky cones were tossed and tumbled like a stormy sea, there was a succession of quiet valleys down below, lying flat at the base of these abrupt boundaries. To this region there succeeded a milder tract of

undulating, grass-covered wastes, enclosed by moderate hills fit for pasture, which led down into another broad valley, through which we travelled on level ground for 30 li to the city of Lang-tai.

14*th*.—We left Lang-tai this morning. A fresh escort of two soldiers came in exchange for those from the last stage. I was thus forwarded on from place to place; but in every case I had to deliver the last passport and to make a request for the men. Everywhere, however, I have met with the greatest civility, deference, and even something approaching to obsequiousness. Lang-tai was full of houses, and struggling hard to recover from its long depression. At this place I first began to discover that there was a Kwei-Chou dialect, which sufficiently diverged from the Peking tongue to puzzle both me and those I addressed to entirely understand each other. Although our stage was short, it proved to be doubly tedious, as we entered a really mountainous region at last, and the road was full of steep inclines. After crossing a low ridge, we skirted a fine valley for about 2 miles, at a great height above it, looking over a rich scene of cultivation and agricultural revival. After this we suddenly got locked in among the hills, and rose, higher and higher, until we stopped to breathe at the very summit of a short, rocky range, running north-west and south-east, which fairly barred the way. My aneroid marked 3400 feet above the sea, or rather Shanghai (which is much the same thing), but I cannot trust its accuracy. A glorious sight was seen on the other side. We were on a level with the majority of peaks massed together, right and left, and far below lay a small plain, to which we had to descend by a very steep path. Masses of white mist floated below, and for a time obscured the fine panorama; but we were up in clearer air, and it no longer rained. The descent was difficult and slow. At the half-way-down house, where the steepest parts came to an end, I again looked at my barometer, and found we were 1400 feet below the splendid point of view we had just left, which seemed incredible. While scanning the mountains from above, I estimated that the average height of the highest ranges was about 4000 feet. From the half-way village (of two huts), where we had to breakfast, the road wound down over a length of some 2 miles, till we reached another plain little cultivated, but, strangely enough, full of large villages. The aneroid had fallen further to 1500 feet. I must not omit to state that, within the first 15 li from Lang-tai, we crossed a coal-bed, which cropped out abundantly on the surface. There were large blocks of solid coal bared to view, and the bank of the highway was a mass of coal-dust, which the settlers simply scraped into their baskets, and carried down to town for

sale. We met several women bent on this errand with light loads, before reaching the source of their wealth. It may be worth mentioning that the rocky ranges, which were grouped about the high ridge we crossed, one and all presented a grass-clad, mild appearance towards the north and east: but on looking back at the towering summits from the valley, I noticed that vegetation stopped short within about 100 feet of the top, facing south and west, and that a precipice of bare, black rock gave a sharply defined outline to the crest. White streaks also marked this rugged face, as though it had been irregularly whitewashed.

15*th*.—Mê-k'ou, our resting-place last night, was only a village, and to-day's stage of 35 li has brought us to another village, named H'ua-king.

As I anticipated, our road was full of rises to-day, and the aneroid marks 3250 feet. The temperature has consequently fallen several degrees. Two high ranges running east and west bounded our horizon, while the intermediate space was valley to the south, and a grass-covered, uneven plateau to the north, fit for pasturage. Cattle are scarce, but carefully bred. There were trees over the hills. Deep red, yellow, and orange tints of autumn showed up with beautiful effect amid the mass of green. The sun had appeared at last, and dispelled the mists. So that altogether the scene was very refreshing, and the journey far less tedious.

16*th*.—The road to-day passed over a long stretch of wearisome hills, covered with tall grass, without trees, without valleys, with only their endless rise and fall always hiding a view of the bold, majestic peaks beyond. The river at Mê-k'ou, I should have stated, is the boundary of the wild-tribe settlements. By inquiries made through my writer, who required some work, I learned something of these Miau-tsze and other wild tribes in the hills, together with the causes of their insurrection. There are two sets of social outcasts—the Miau-tsze and the Chung-chia. The former, although they assimilate both in dress and general features to the Chinese, just as the Shans beyond Yun-Nan, described by Dr. Anderson, never belonged to the Celestial race. They were the aborigines of this region at the time when the Han dynasty (B.C. 202 to A.D. 200) extended the Empire westward, and colonised this province from Hu-Nan. The Chung-chia are the descendants of those colonists. Both "nations" have several subdivisions, distinguished by little peculiarities of dress, and are mostly called by names describing the same. I saw representatives of three or four sects, and could easily see the difference. For instance, there are the White Miau; the embroidered Red Miau; the Black Miau (who, by the way, wear ear-

rings as well as black clothes; the men but one, the women both); the Light-Blue Miau; the Flowered Miau (who wear sleeves only of coloured stuffs, like chintzes or brocades); and, oddest of all, the Duck's-beak Miau (who wear a thing like a duck's beak on the back). The women are the badge-bearers, the men doing as they like in the matter; but the latter mostly dress like Chinamen in the universal blue. The Chung-chia have three classes:--the Pu-la-tsze (among whom the women wear pigtails as well as the men); the Pu-i-tsze (whose women wear silver plates on the head for caps—*absit omen!* I hope the thirst for novelty elsewhere may not adopt the hint); and the Pu-lung-tsze (distinguished by the coiffure resembling a raven. They all wear the Chinese garments, but add a border of some other colour. These people exist in great numbers between An-hsüu and Mê-k'ou, along the route we have followed. The Miau-tsze inhabit more generally the region between Ch'ên-yuen Fu and the capital. Judging by the state of the cities, and the universal ruin on that side and this, I should say the aborigines excelled the colonists in the fierceness of their onslaught. It was a combined movement, and the opportunity arose when the Mahommedans held Yun-Nan, and the T'ai-p'ing rebellion overflowed Kiang-Si and Hu-Nan. The reason of this rising was not an idle one. The Chinese had oppressed both classes, socially as well as officially; and while the one said, "We are Chinese as well as you, and yet all honours, riches, and advantages are debarred us," the poor wretched Miau-tsze had to complain of scorn, contempt, and legal robbery in rents and taxes.

17th.—The night was cold in our barn, or rather shed. On rising, I found the temperature to be 48°; in the afternoon, however, it rose to 60°. I was told by the villagers that they have snow in winter. Their houses, built so open to the air, would lead one to an opposite conviction. But then these people never change their clothes night and day, and make up for the rest with cotton quilts. The beds in the best inns are merely loose planks placed on logwood tripods, and covered with dirty straw. Apparently the accumulated dust has never been disturbed, except where I happened to lie. Coal-dust is in general use at the villages we pass through now, and to-day we crossed another bed of it, less distinctly marked on the surface. By compensation for yesterday's tameness, we were refreshed to-day along the whole route by the sight of smiling valleys, full of life, and colour, and cultivation. They did not lie so flat as those seen above, but seemed to grasp the undulating hills of red sandy soil, and cultivation was carried up in the familiar terraces to every available spot. Trees were

plentifully scattered about, and added to the beauty of the scene. There were the sycamore, the plane-tree, the poplar, and the Spanish chestnut, a pretty, smooth-leaved holly, covered with red berries, and the universal pine. The further we go west, the more we find of cultivation and population. The villages increase on the road, and there is more small traffic; oranges from Yun-Nan and straw shoes come along; while drovers are met with flocks of sheep—flying eastward, some say, from the cold weather of Yun-Nan; others, to feed their flocks on the grassy hills of which I have spoken, pasture being scarce in Yun-Nan. Kwei-Chou must have a temperate climate, for the houses are not built to guard against cold, and, amongst other signs, I notice that the horse-chestnut has not yet dropped its faded blossoms. So far the average temperature we have experienced has been about 55°. The droves of sheep have been recently shorn, and numbers of young lambs accompany the flock.

18*th.*—The road to-day passed through a number of valleys full of rice, and watered by small streams running in a north-easterly direction. The distance to the *Chou* city of P'u-an was only 40 li, which had to be accomplished in one stretch.

19*th.*—On leaving early this morning we met hundreds of men and ponies carrying coal into the city. It was mostly in dust, but a small quantity was in lumps of a useful size. Further on we saw the mine or narrow shaft from whence it was all procured. The shaft was driven at a downward incline, contrary to the usual practice in China. I don't know how they get rid of the water. About a mile from P'u-an, we began to ascend the last great barrier on our road. It was called the Yun-Nan Pass, and exceeded all the others in length. But the incline was easy, and the summit moderately high (3300 feet). There was no steep descent on the other side, the road passing over a high plateau of very poor land. Before reaching the crest of the pass, I looked back on a lovely scene. The fine valley was decked out with autumn tints and harvest gold. The high hills all round were strown with large patches of red soil in among the trees, and the city, with its crowded roofs and triumphal arches, lay in a cradle below. The last half of the stage was barren ground; rocky, rough, low hills on both sides, and coarse grass growing among boulders in the middle. Towards the end, however, we came across a beautiful valley in which all the harvest operations were over, and instead of yellow, the sombre colour of rich earth relieved the eye. The stage had been a long one, and the bearers, thoroughly tired out, dropped the chair with a well-feigned slip, and so compelled me to walk a long way in the closing darkness over an atrocious path.

20th.—We were now 15 li from the boundary line of Yun-Nan and Kwei-Chou. The excitement of crossing the border, and entering the famous Province, which filled us at starting, was rather damped by the morning rain, but by noon the sun shone out almost uncomfortably and dispelled the mist. The road sloped down easily over a red sand waste towards the frontier town, which was distinguished by an arch at each end of its single street. The view towards Yun-Nan was disappointing. There did not seem to be any termination of the undulating rock-covered hills, which extended as far as the eye could see. A short stage brought us to the first city of Yun-Nan lying in our way; the magisterial city of P'ing-i Hsien, where I was received with marked incivility by the Mandarin (a Kiang-Su man named Hsia). It was a kind of rudeness which a Chinaman can so easily show without going far out of the way, and consists in using expressions applicable to an inferior, and omitting forms of etiquette which are held indispensable. He seemed to be suspicious of the local passport and examined the seal critically. I was able to cut all this short by reference to the Tsung-li Yamên despatches, and the letter of the Kwei-yang Fu-t'ai, which he owned to having received. He carried out his instructions, however, and sent two men as escort.

Our road on the 21*st* was beautifully level over the broad battened red sand. Before reaching our resting-place, a town called Pai-shui, there intervened one fine plain at last, through which a narrow stream flowed in a general northerly direction. The harvest was just over, and beans were shooting up between the stubble. In every village a lively scene met our view. One and all were engaged in either stacking the straw or wielding the flail. In Hu-Nan and Kwei-Chou they have a curious habit of hanging the straw on trees instead of stacking it on the ground. They select a tall young fir or any tree which is free of leaves for 15 or 20 feet, and suspend the bunch from a point in its trunk. The tree looks as if it wore a crinoline drawn up rather high. The plain was full of flocks of storks.

22nd.—The road to-day for half the stage passed over another plateau of waste uncultivable land on which there was little grass even, but a great quantity of rocks and stones. We noticed lumps of iron lying about, of an almost pure quality. The soil everywhere on this plateau was very rich in variety. Underneath the all-pervading red there were calcareous deposits. Numbers of large boulders of pure chalk (?) lay about. There were several banks of clay of various colours, especially green and purple. The whole field was painted. But the

region was nothing but a rough desert of undulating ground surrounded with hills. The latter half of the stage, however, beyond the half-way village of Hai-tzu P'u, improved in scenery and verdure. Wherever the rice-harvest was being gathered in, the road was full of buffalo-carts conveying the grain to the village. The people are not particular about choosing a clean threshing-floor, and, as often as not, scatter the very street with grain and straw; and the street of a Chinese village is better left undescribed. On nearing the end of our journey, the plateau suddenly came to an end, and a very fine plain burst on our view. It stretched away to the south and widened as it went. The city of Chan-i Chou lay opposite us on the other side of the valley, about 2 miles off. The bearers, with the goal in view, redoubled their speed and almost ran me into the city. I sent my card to the Mandarin; but here again the same sort of incivility was offered. No card was returned, and no answer could be obtained to a civil request that the escort might be sent early, since we had to start at daylight. As the Mandarin probably knew little or nothing about all this, I sent my writer with the Treaty to enlighten this all-powerful janitor and factotum on my position. The result was that the Magistrate's card arrived by-and-by with an answer to my request.

23rd.—After waiting in vain for an escort, I started next day without it. At length a stupid old man turned up, who proved very useless. Instead of sending two or more men, as all previous officials had readily done, they had taken the liberty at the Yamên to change the number stated in the warrant, and so reduced me to the certainty of only having one man sent for the rest of the route; for they copy one another faithfully. But we are near the capital, the road is good and the people are civil, so I do not pay much attention to this want of courtesy. On starting from Chan-i we at first followed its splendid valley due south for a mile or two, and then abruptly broke out of it at right angles, to ascend a series of small, but uncomfortable passes which led up to another dreary plateau, like those we have already passed. The valley was well cultivated with rice, and the harvest being over, the numerous flooded fields gave the appearance of a vast lake to the plain as seen from above. Numerous flocks of storks found a good feeding-ground thereon. But a good deal of this space was really a swamp, and not yet put to use. There were high causeways running in all directions, but many had fallen to pieces in different places. Their existence seemed to indicate the occurrence of floods. We reached the city of Ma-lung Chou in good time, and found a very fair lodging at the kung-kuan.

24th.—Left Ma-lung Chou before sunrise in order to complete

80 li in good time. The country improved in appearance by the addition of trees, which, though stunted, grew abundantly on the hills and plain, relieving the desertlike monotony of the red soil which still continued.

25th.—We slept last night at the town of I-lung Ssŭ, and having another long stage of 75 li before us, left at daylight. Our road, always wide and level, passed through many lanes and hedgerows. The wind, as usual every day, blew uncomfortably from the south-west, parching the skin of our faces and producing disorders of the throat. I noticed that it sprang up about 9 A.M., the earlier hours being still and undisturbed. Houses everywhere wore a neat and comfortable look. They were detached and roomy, built of sun-dried mud bricks and well tiled. But we no longer saw the open exposure to the air which distinguished those of Kwei-Chou. Wind and cold were carefully shut out. On nearing *Yang-lin,* which was a town now, but must have been a city once, the road skirted a large lake covered in many parts by tall reeds. It was an immense expanse of water, and is said to afford quantities of fish. Soon after this a magnificent plain burst on our view, well studded with new villages, but swarming with ruins of old ones.

26th.—On leaving Yang-lin the ruins caused by the war were sadly prominent. The area covered by houses was evidently very large, and from its splendid site, and quick revival, I should think this must have been an important city. The distance to the capital was 105 li, on a very level road. Along the whole route I have had to struggle against wrong information. Distances and routes vary, apparently according to the ideas of different persons, and the result is that I have been misled to the extent of losing ten days. Instead of twenty-five days being sufficient to accomplish the journey from Ch'ên-yuen Fu to Yun-nan Fu, I have only managed to reach the threshold of the latter city in thirty days; and this after every effort to hurry my conductors.

27th.—Reached the city of Yun-Nan before noon. My servant met me at the gates and conducted me to a very good official inn. The road was crowded with people passing to and fro. Carts conveying firewood, mingled with ponies carrying charcoal, jostled coolies coming out with loads of salt slung at the ends of their useful bamboo. The short suburb was full of saddlery shops and the stalls displayed nicknacks, opium-lamps, and ornaments. One solitary clock was the only representative of foreign ware which met my gaze. The people were not curious or troublesome, and I entered the city unescorted, without the slightest difficulty. There was nothing showy in the approach. Ruins surrounded the walls and dotted the mag-

nificent plain stretching far away. The city is on level ground, and therefore not picturesque. A few very neat and original examples of roofing near the gates showed the best points of Chinese architecture.

Next day a splendid double repast of choicest Chinese dishes was sent down by the Magistrate, for me and my servants. Eight large wooden trays containing fifty-six bowls of different dishes and sweetmeats, all ready for the cook's hands, met my view on entering the room, and four cooks from the Yamên were ready to operate. I never enjoyed a better dinner. After this I proceeded in my chair to call on the Magistrate, who received me very well, and pleased me so thoroughly in his appearance, bearing, and straightforward manner, that I no longer cared to see the Governor, and entrusted all I wanted to him. My first object was to communicate with Col. Browne in case his party should arrive first, and to request the Acting Viceroy to send instructions post-haste to the Yung-ch'ang Fu officials, to give him every assistance. And secondly, I asked for an escort for myself and a letter to all the mandarins *en route* explaining my position and object. The Magistrate, whose name is Pien, readily promised to convey my requests to the Viceroy, and so, with warm thanks for his civility, I concluded a very agreeable visit.

29th.—The Magistrate returned my call this morning and said the Governor was extremely busy just now, but would be ready to see me when I came back from Yung-ch'ang Fu. He had deputed a couple of Mandarins to escort me the whole way, and was about to send a flying despatch to Yung-ch'ang Fu, which would arrive in four days at that city, and my letter to Col. Browne would be forwarded by the same opportunity. In the course of the afternoon I received a message from the Governor, requesting me to wait another day to allow time for the escort to get ready. I was obliged to acquiesce, although time was very precious.

Did not leave till *December 2nd.*—The road passed across the valley towards the hills. Peasants were hard at work irrigating the fields with water-troughs and paddles worked by the hands. Several strings of animals came along the road, loaded with salt for the capital, and irritated the chairbearers greatly by their erratic motion, which continually threatened a collision with the chair. Mules, donkeys, and ponies were mixed up together in each gang, and a couple of mules invariably led the way, decorated in the most fantastic manner about the head with red rosettes and tassels surmounted with a bunch of long feathers like a Red Indian chief. We came to a full stop comparatively early in the afternoon at the top of a small pass between 30 and 40 li from the capital, called Pi-chi K'ou.

There was only one decent inn to be found, which consisted of a single large chamber, a small corner of which was boxed off with clean woodwork for superior guests. Two gaunt buffaloes were stabled in close proximity on a floor of slush; the kitchen filled a third corner, and Messrs. Chou, Yang, and three or four of our servants found their roosts along the other sides. Chou filled up the time by smoking opium. There is something attractive in the process of taking opium, which must compensate a Chinaman for a great deal of discomfort. His bedding, which merely consists of a couple of quilts, is neatly arranged by his servant, part as couch and part as pillow, and he throws himself down to play with his pipe, and tray full of inviting nicknacks (treasures in themselves), careless of surrounding circumstances. And each whiff costs him some pleasant exertion, for fully ten minutes elapse before the pinch of opium is reduced to the proper consistency by being twisted and twirled about at the end of a short spit in the opium-lamp. I had a long conversation at night with the two officers on the subject of railways and modern inventions. They praised up the English with a flattery that I was obliged to rebuke. But their appreciation of our moderation in war was genuine, and the name of Queen Victoria was mentioned in terms of respect and admiration. They knew the history of Her Majesty's accession and reign, and the exalted character of our sovereign reflected most favourably on the estimation in which they held the nation, and its representatives in China.

3rd.—We only accomplished 40 li to day, stopping at Anning Chou. Since the war brought ruin on every town, there has not been sufficient time for resuscitation, and consequently travellers cannot move beyond stated distances where inns are to be found. The country to-day showed signs of past cultivation, but now lies utterly deserted. A large quantity of young trees grew on the hill-sides, and we were not far from a range of mountains. The hedgerows and surrounding ground abounded with brambles, and the cactus appeared in thick bushes. The road was still full of carriers occupied with nothing else but salt. At Anning Chou, I was paid extraordinary honours by the local authorities.

On the 4th, having a long stage before us, we started early. The thermometer marked 46°, and a thick white mist filled the air, until the sun rose high enough to dispel it; and the rest of the day was almost uncomfortably hot. The road was rough and deeply indented by mule-tracks. Hundreds of animals met us, employed in carrying salt. The greater part of the way was waste, uncultivable land, covered with hardy shrubs and stunted trees. But now and then a valley appeared which

was partially retilled, and one or two villages, re-established among ruins, stood prettily embowered among trees. The semi-civilised border-tribes seem to trade occasionally in the province. They wore coloured, embroidered garments, and presented other peculiarities which I had not time to notice in passing.

The road, on the *5th*, has outdone everything hitherto encountered in utter badness. In addition to its natural imperfections, I believe the retreating Mahomedans purposely destroyed the pavement in order to throw difficulties in the way of the Imperial troops. There is scarcely any level ground in the whole length of this tedious stage of 75 li to Lu-fêng Hsien. It is full of steep passes, the chief of which rises to 3500 feet (by my aneroid), and the track by which it is surmounted is simply a chaos of deep ruts and broken stones, offering the acme of dangerous footing to animals as well as carriers. On arriving at Lu-fêng Hsien, I was greeted outside the city by the Magistrate's card-bearer, who knelt according to custom, holding up his master's card, and politely informed me that the official travelling quarters were ready for my reception.

On the *6th* we started at an early hour, the thermometer at 46°. The stage was the longest we have yet accomplished, being 90 li, and much of it over steep passes. The mountains were thickly covered with pine. All the villages were in ruins, and the valleys, of which we crossed three or four, are sparsely inhabited. One very heavy pass, involving several li of a severe incline, intervenes in the long march, and by a steep descent leads to the town of Shê-tzu.

The temperature was 42° at starting next morning, but before very long the sun shone out strong, and by sunset the thermometer had risen 20°. The road was still full of difficult passes and deserted villages. If only an easy road lay ready between Yun-Nan Fu and Bhamo, a perfect flood of British goods would be swallowed up at once for the Kwei-Chou and Sze-Ch'uen markets. The merchants of the latter province would naturally prefer to buy at Yun-Nan, and float their goods down the Yang-tsze, to the risk and expense of the difficult ascent from Hankow up the I-ch'ang gorge. Native cloth is so dear in Kwei-Chou and Yun-Nan, that the people cannot afford to buy it, and their ragged appearance is due not so much to poverty as to the price of cloth being beyond their means. There would be an immense sale if only Manchester goods could be cheaply conveyed. Watches are wanted badly by the rich classes, and there is a great eagerness to know the price of most of my foreign productions. Cutlery and ordinary crockery excite admiration, and almost anything foreign would speedily

entice buyers, if I may judge by the high appreciation and unfeigned coveting displayed by the few who examined my possessions. Kuang-t'ung Hsien, our destination, lay in a fine valley, which sadly wanted inhabitants to recultivate its broad acres. I was exceedingly well received by the Magistrate, who was a young Kwei-Chou man, and before leaving we became great friends.

8th.—Left Kuang-t'ung. The road was far better to-day, and only two insignificant passes had to be crossed. Lunched at a town called Yao-chan, which lies in a fine valley watered by a good-sized stream, and contains some inns. The road followed the banks of this river for the latter half of the stage almost up to the prefectural city of Ch'u-hsiung, where we stopped. Some peasants were engaged in floating timber down the stream. It was all cut into small lengths, and myriads of these covered the face of the river, part in swift motion with the main current, and part lazily floating down the sluggish flow, while a quantity remained jambed in an immovable mass. The wood-cutters running along the banks with poles seemed to have no easy task in hand to keep their straggling property together. The villagers appeared to be better off, and more comfortably clad, in the Ch'u-hsiung district. Those of them who hailed from Yung-ch'ang Fu or T'êng-yueh Chou, on the borders, showed a decided predilection for colour and embroidery about their persons. Several individuals wore scarlet jackets of a ribbed cloth, which I am told is a product of T'êng-yueh Chou, and I noticed how many of the wayfarers who met us on the road were becomingly decked with waist-bands or cummerbunds of pale pink or yellow. This taste for colour is, no doubt, derived from the example of their nomadic neighbours on the borders of Yun-Nan, and presents a very agreeable contrast to the uniform dark-blue which otherwise prevails throughout China as the national dress.

9th.—We started early this morning in order to accomplish a very long stage to reach the city of Chên-nan Chou. The road was good, and the bearers were able to keep up a fast pace throughout. After passing through the rich valley of Ch'u-hsiung Fu, we crossed a series of low, easy passes, always leading to a valley, with the surrounding hills prettily covered with young pine-trees. The country was less and less inhabited as we proceeded, and the people more miserably clothed; often wide flats appeared, given up to rank grass, and occasionally the road crossed a desert of brambles and wild bushes growing on a hard bed of clay. There was a quantity of pure white-clay fit for porcelain, and different-coloured mounds of Lias gave a strange aspect to the ground. Coal cropped out at one spot,

and a shaft was actually being worked higher up on the hill. Buffalo-carts reappeared on the plains, and a river frequently had to be crossed over good stone bridges. In the earlier part of the stage a good deal of building was being carried on by rich proprietors, and I noticed one example of the way they construct the massive earth-walls so characteristic of the district round about. The mud was thrown in between planks of wood, and battened down with clubs. Each layer became hardened in the sun, and the wall had the appearance of being built in strata of about a foot thick.

Next day we reached the town of Sha-ch'iao, and on *December 11th* had to rise early in the morning as 95 li lay between us and the next resting-place, a town called Pû-p'êng by the natives, but which is entered in the Chinese map as Lien-p'êng. The first 30 li of the way skirted the well-cultivated valley of Sha-ch'iao. Then followed, 20 li of steep climbing up a narrow ravine, which was full of trees and shrubs, and contained a brook of clear mountain-water, tumbling down at a great velocity. It was a beautiful piece of natural scenery, but the dangers of the rough and tortuous track, by which we had to thread our way, marred the pleasure which it excited. It was disturbing to be hung over a precipice at an angle of about 30°, while the bearers were turning a sharp corner, and to feel the slips which they could scarcely avoid on the loose red sand which thinly covered the rock under foot. It was one long ascent every inch of the way until we reached a village at the summit, which was the halfway-rest. The remainder of the road was tolerably good. It first descended a ravine slightly, and then followed a high level overhanging a deep precipice well veiled with trees. This debouched at length on to an arid, uncultivable plateau of red sandstone, undulating, and sparsely covered with shrubs and a few stunted trees. Along this desert we were on a level with the tops of a mass of hills, stretching away before us as far as the eye could see. A little cultivation was carried on in terraces, but otherwise it seemed to be a red sand waste far and wide. I was surprised to see quite a large town in the midst of this wild plateau, and still more to find that it contained a yamên, in which we were soon very comfortably settled and fed by the hospitality of the Prefect of Yao-chou, in whose jurisdiction the town lay, and who had actually sent down his servants a distance of 180 li, or two days' journey, from the city to provide for us. Such incomparable civility proves how thoroughly the Viceroy is to be relied on. His career has been marked by "thoroughness." I listen daily to stories of his remarkable campaigns against the Miautsze in Kwei-Chou, and the Mahomedans in Yun-Nan, which the old

soldier Yan loves to dilate upon after dinner. But as his accent is provokingly provincial, I unfortunately cannot keep pace with his rapid utterance, but I hope to know all about this hero before returning to Yun-nan Fu, where I have been promised the honour of an interview. The Ta-li Fu people are troublesome and dangerous. I was told so by the Chên-Nan Magistrate, and it was for this reason that the Viceroy sent two mandarins with me. We are four stages from that city, and I am to remain a whole day at the previous stage, while Chou and Yang go ahead to ensure arrangements for my comfort and safety.

[Notwithstanding the reports of the turbulence of the population of Tali-fu, subsequent letters of Mr. Margary spoke of his kind reception in that city on the 17th of December. His route then led viâ the city of Yung-chang to Momien and Manwyne, on the frontiers of Burmah. At the latter place, where he was subsequently murdered, he was also very well received by the local authorities. He joined Colonel Browne's party at Bhamo on the 15th of January; having thus accomplished a journey through the South-western Provinces of China, which no European had succeeded in doing since the Jesuit missionaries in the early part of the eighteenth century. Mr. Margary, as stated in the prefatory Note, was assassinated at Manwyne on his return to that place, in advance of Colonel Browne's Expedition, on the 21st of February, 1875.]

VI.—*A Visit to the Valley of the Shueli, in Western Yunnan, February* 1875. By N. ELIAS, Gold Medallist R.G.S.

[*Read*, February 28th, 1876.]

THE following note on the Shueli Valley, and the route between it and Bhamo, was written as an Appendix * to a detailed Report of my proceedings while detached from the main body of the late ill-fated Expedition to Yunnan. No more of those proceedings, however, need be given here than is sufficient to show the circumstances under which the journey was made, and the causes of its untimely termination.

Two journeys through the hills of the Lenna Kakhyens are alluded to in the note, for it so happened that before the departure of the main body of the Expedition from India I had been ordered to Bhamo to prepare the means of transporting the

* For a variety of reasons it was never appended to the Report.

party across the Kakhyen territory into China; and in order to carry out these instructions I found it necessary to visit the Lenna Chief at his residence at Palaungtu, among the hills overlooking the Shueli River below Mung-Mau. I left Bhamo on this duty on the 19th of December, 1874, accompanied by a Kakhyen interpreter and half-a-dozen porters, and after spending a few days with the Lennas in arranging the details of an agreement for passing the Expedition through their hills, returned to Bhamo on the 29th of December. Though they had never before been visited by a European, these Kakhyens behaved in a most friendly and hospitable way, and carried out their part of the agreement entered into, in a thoroughly faithful manner. On the arrival of the main body of the expeditionary party, however, the leader endeavoured to alter the terms of the agreement with the Lennas, whose chiefs had come to Sawuddy to meet him, and on these evincing a disinclination to submit, he thought it prudent to provide himself with a large body of armed Burmese to protect the party during its passage across the hills. But as the Lennas regard the Burmese as their enemies, and never admit them into their hills, they naturally looked with mistrust on this body of nearly 300 armed men being marched through their territory in addition to the terms of their original agreement, and, after some discussion, eventually declined to transport the English party at all. The Lenna chiefs then returned to their hills, and the Expedition was placed in the hands of the Burmese authorities for the purpose of being transported by the Northern or Tapeng route, where a trap had been carefully prepared for them, and into which poor Margary was allowed to fall.

On the rupture of relations between the Lenna chiefs and the leader of the Expedition, it was intimated to me by an agent of the chiefs that I should be received with the same friendship as before, if I passed through their hills to China without any armed Burmese in my train; and taking advantage of this, I obtained permission to detach myself from the main body, and on the 10th of February again started for the hills of the Lennas—this time accompanied by Captain Cooke, the political agent at Bhamo, when the same hospitable treatment was met with as on the previous occasion. The hills crossed, the Shan town of Mung-Mau was reached on the evening of the 14th of February, Captain Cooke returned to Bhamo on the morning of the 16th, and I then found myself stopped by the Chinese officials from prosecuting my journey any further into Yunnan. After several days of fruitless negotiations with the head military official (one Li-chun-kwo, otherwise known as Li-sze-ta-yeh), I crossed the Shueli to the Burmese Shan township of Nam Kam, in order

to try and get forward by a different route; but meeting there with similar obstruction, instigated by certain Burmese officials, I was constrained to halt for a while and communicate with Bhamo. While stopped thus, at Katlung, in the neighbourhood of Nam-Kam, on the 27th of February, I received news from the chief of the Expedition of the disaster that had befallen his party, together with orders to return at once to Bhamo. The friendly Lennas once more passed me safely through their territory, and I arrived at Bhamo, by means of forced marches, on the evening of the 2nd of March.

Of the numerous routes leading from Bhamo and its neighbourhood to Western Yunnan, two only are trade-routes, properly so called, viz., the Northern or Tapeng route, already reported on by Major Sladen and Dr. Anderson, and the lower or Sawuddy road. The middle line, known as the Embassy-route, joining as it does with the Northern at a short distance within the Chinese border, being seldom used for purposes of commerce, can scarcely claim a place as a distinct "Trade-route;" whilst the remaining ones, both north and south of the Tapeng, are chiefly loop-lines, or short cuts from various points on the Irawady or the Mogamy River, in use among petty local traders, jade-miners, and the aboriginal tribes, but rarely employed as a means of through communication by persons trading between the commercial centres of Burmah and China.*

The northern of the two Bhamo trade-routes is the direct road between that place and Momien, and is used almost exclusively by the through Chinese traders; while the Sawuddy road must be regarded more as the resultant of several minor ones leading from the towns of Western Yunnan to the lower Chinese Shan States, and connecting these latter with Sawuddy as a point of shipment on the Irawady, or, what is the same thing, with Bhamo, for the two places are but 9 miles asunder, the swampy nature of the country between the foot of the hills and Bhamo rendering it less convenient to make the latter place the terminus than Irawady.

The plain between the lower slopes of the hills from which the Sawuddy road descends and the Irawady, is, roughly speaking, from 9 to 10 miles broad, at an elevation about equal with that of the Irawady when in flood; and the numerous streams shed from the slopes of the ranges having thus no *fall* after reaching the plain during that season, spread themselves out in the form of swamps or shallow flood-lagoons that have no means of receding in the autumn with the subsidence of the Irawady or the streams that give them birth, and consequently

* See Note I., p. 214.

are left to be dried up by evaporation—a process that is only completed in ordinary years by about the end of December or the middle of January.

Thus there exists during the winter and early spring only, a practicable road between Bhamo and Mansey, the point where it converges with the track from Sawuddy and enters the hills. The direction of this line also is athwart that of the streams which, when in flood, are sufficiently deep, and are difficult for loaded animals to cross in the absence of bridges: on the other hand, the road connecting Sawuddy with Mansey is in the direction of the streams, and consequently none have to be crossed; and, moreover, the greater part of the latter passes through a jungle of heavy timber, where the soil is firmer, and where the water lies for a shorter time.

When on my first visit to the hills of the Lennas in December 1874, it was necessary, in order to avoid the flooded tract on the outward journey to Mansey, to make a detour through the village of Namo-poay, bringing the whole distance up to 16 miles; while on the return the Sawuddy road was followed—a distance of about 11 miles—and thence by boat to Bhamo, 9 miles. Again, on the last occasion of crossing the hills, both going and returning (February and March 1875) the direct track from Bhamo to Mansey was practicable, leading through the villages of Kang-gyi and Thein-leng, and involving only some 13 miles, with the streams at a fordable depth.

Mansey stands in its own paddy clearing of about one square mile in extent, and is surrounded by the usual bamboo stockade. Like all the villages situated on the plain between the hills and the river, it is under the protection of a Kakhyen chief, for it is within the reach of Kakhyen power, and consequently beyond that of the Burmese Government so far as the Kakhyens are concerned. The protecting genius is the Lenna Tsaubwa, but the system adopted I believe to be the same as in all other cases of "protected villages:" thus a Kakhyen Tsaubwa, after concluding a certain agreement for the mutual benefit, takes a village or villages under his protection, hangs up his "dah" or sword, in the house of the headman of the place, and sends a "representative," usually a relative, to reside with the latter; the "dah" an emblematic token that all comers may look to its owner as the champion—the "representative" a kind of living guarantee or hostage for the satisfaction of the villagers that he intends to act up to his engagement in protecting them against all enemies, and in abstaining from hostility himself. This custom obtains on both the Burmese and Chinese sides of the hills, and the return usually made by the villagers to the Kakhyens is, I believe, more in the form of services as agents or

"procureurs" in the low country, which it is not always convenient for the Kakhyens to visit, than in the form of actual payment, though a small quantity of rice is, in some cases, at all events, paid annually to the protectors. The inhabitants of these villages on the Burmese side are nearly exclusively Burmese Shans, speaking both these languages, and generally Kakhyen also, with equal fluency; hence their headmen or Tamones are usually employed by the Burmese authorities as the means of communication with the Kakhyens, and are not unfrequently made responsible for acts committed by the latter, or for orders not obeyed by them.

In ascending from Mansey the track leads for a short distance across the low land to the eastward, and then commences to mount the first spurs of the hills on a more southerly bearing, forking, however, into several other directions with a general easterly trend during the first two miles. The main line is a rough mountain-pathway leading along the side of what may be called a secondary or transverse range, which appears to be one of a series of three or four that abut at one end on the valley of the Irawady and at the other on that of the Shueli, running almost parallel one to the other in a general E.S.E. and W.N.W. direction, and attaining their greatest altitudes at points somewhat nearer the Shueli than the Irawady. At or near these culminating points the valleys between the ranges become much contracted and elevated, in consequence of which the whole viewed from below, especially from the Irawady side, appears to form a connected north and south chain—an appearance that is only dispelled, indeed, when, in travelling across the hills, the line of greatest altitudes (roughly speaking, about 5000 feet) has been reached.

The distance to Wurabhum, the first stage, is about 19½ miles (including the windings of the path), and with the exception of small patches of paddy in some of the valleys near Kakhyen villages, the whole is through forests of heavy timber on the lower slopes, and smaller trees higher up, with here and there patches cleared of all undergrowth by jungle-fires, but with the charred stems of the larger trees still standing to serve as fuel for the Kakhyens. The views obtained of the Irawady valley and neighbouring mountains from various points, as one ascends, are extensive and beautiful: the river itself, with its islands and sandbanks, can be clearly traced from its egress from the third defile to its entrance into the second; the Kauntung or Tsen-ka stream can be seen throughout its course through the plains to its confluence with the Irawady, though its upper waters are hidden by the hills. Many of the villages of the plains, also, though distant nearly 20 miles, are discernible by their clearings,

which form the only relief to an apparently interminable forest, and which serve to show at a glance how insignificant the population is, and how small the proportion of land that has been reclaimed and settled. The first half of this stage is through the territory of the Kara subtribe, three of whose villages are passed on the road, including Pita, the chief town, consisting of about a dozen houses; on the second half, in Lenna territory, the way leads through numerous paddy clearings, and small villages would appear to be tolerably numerous, though at a distance from the road, and seldom seen as the traveller passes along.

The march from Wurabhum to Palaungtu is a short one of only some 12 miles, and through country similar to that between Pita and Wurabhum, with the exception that the timber in the forest becomes less in size as the altitude increases, and consequently gives a more open appearance to the scenery. The road is no better than lower down, being merely a rough hill-side track, while many of the nullahs and rocky places it is necessary to pass try severely the endurance of loaded animals, and would, of course, be utterly impassable to any other means of conveyance, except coolies. Nevertheless it is said to be easier than either the northern or the middle route, and the section between Mansey and Kutlung to be the most difficult of the whole distance to Momien or Yungchang. The villages passed on this stage are more numerous than on the previous one; few of them, however, consist of more than eight or nine houses, though one of them, Paitan, about 4 miles from Palaungtu, has about twenty. It is situated within half a mile of the left bank of the Kauntung River, here a considerable mountain-stream, called the Moyun, and just below the point where the road to Palaungtu, diverging from the main road to China, takes a more southerly direction, while the latter conducts straight to Nam-kai and Kutlung.

At Paitan, besides the little gardens of tobacco and vegetables ordinarily seen around Kakhyen villages, one meets with small enclosed patches of poppy, all of white flowers, and having a very straggling uncared-for appearance. I was informed that small quantities are grown also at other villages, but that the whole forms a very insignificant proportion of the amount of opium consumed, the balance being obtained from the Chinese Shan provinces of Yunnan. Nearly every grown-up man among the Kakhyen tribes that I am acquainted with is a smoker; but I have seldom observed boys, and never women, indulging in the vice, as in some parts of China. The mode of smoking, too, is different from that practised in China. They first dissolve the drug into a liquid, boil it in a copper-ladle held in the hand, and

then steep the fibres of plantain-leaves in it, these leaves having been previously dried over the fire and crumbled up between the hands till nothing but the fibres remain; the whole is then smoked in a rough bamboo-pipe, in shape something like that of a German peasant, only stiff and straight instead of curved, the smoker usually sitting up while using it. The opium thus used is apparently of an inferior description and by no means strong, while the boiling process weakens it still further, and leaves, I should say, a comparatively harmless mixture to be smoked—a conjecture that is borne out by the slight effect a series of three or four pipes at one sitting appears to have on the smoker, and also by the absence among these people of that yellow, haggard, worn-out countenance so familiar to travellers in China. The upright position of the smoker, I think, might be taken as further evidence of the mild effect produced by the opium as smoked by the southern Kakhyens, for certainly no Chinese smoker could endure the effects of the drug as he is accustomed to use it, except in a recumbent attitude.

Some 2½ miles after leaving Paitan, and taking the road to Palaungtu, it becomes evident that the greatest altitude has been reached (about 4700 feet), and shortly afterwards a distant, but magnificent view is opened out of the Shueli Valley, with the river winding in an almost south-westerly direction through it, and, beyond, the mountains of Yunnan, stretching in what, from this point of view, would seem to be from north to south, though when seen in profile from the valley below, this direction becomes greatly modified, and there is fair reason to believe that the mountains one here sees as a range or chain bounding the river-valley, is in reality no chain, but simply the edge or escarpment of a mountain mass through which the river has forced its way and cut for itself a valley.

The point on the road to Palaungtu at which the greatest altitude is reached can scarcely be called a pass, for the track winds obliquely over a rounded ridge of gentle gradients on both sides, and itself sloping in the form of a spur towards the south. On the direct road, however, which leads from Paitan in a more due easterly direction, the case is different, for the line of greatest altitude (there about 5220 feet) is passed between summits of several hundred feet above the road, and where the ascent and descent are sharply marked as in the case of crossing a distinct range. The two roads join again a little below the small Lakun village of Nam Bong at a distance of about 10 miles from Paitan by way of Palaungtu, and 9 miles by the direct track. On the whole, the direct line is the easiest for the passage of loaded animals as well as the shortest, for though the gradient between Nam Bong and the Pass is suffi-

ciently steep, still the road is fairly smooth, and there is good camping-ground in several places. The village of Palaungtu consists only of some eight or ten houses, and, though the residence of the ruling Tsaubwa and the Homa (the youngest lineal descendant or heir-apparent), it is remarkable for nothing but the beauty of its situation. The road between it and the junction near Nam Bong is, perhaps, the roughest section of the whole traverse, and no clearings are met with except one or two small patches containing graves, and which are known by the rough bamboo pagodas that are erected over the tombs of the common people, or the equally rough imitations, also in open bamboo work, of Chinese temples over those of the Tsaubwas.

At about 1 mile beyond the junction of these roads the Lenna village of Nam Kai is reached, situated on the top of a rounded hill, and consisting of about forty houses, the largest Kakhyen village to be met with on the Sawuddy route. From Palaungtu an extensive view is obtained northward towards Hotha and Mourm, while a cross-road leads direct to the former of those places, and is said to be travelled in four marches by Kakhyens on foot. No trade, as far as my information goes, passes by this road (or more properly jungle-path) in ordinary times, though possibly, when other routes are closed by disturbances, this one may be availed of as a means of reaching the Irawady by a round-about process. Whether or not a portion of it is the path followed by Major Sladen's native surveyor on the return journey from Momien, it is impossible to ascertain with certainty from the itinerary he has furnished, but possibly it may be, though he could hardly have followed it so far south as Nam Kai, seeing that he arrived in the plains of Burmah by the Ponkan (Phongan) route. Shortly after passing by Nam Kai one or two small Lakun villages are met with, isolated, as it were, in Lenna territory, after which no dwellings are seen till emerging from the hills on to the flat plain of the Shueli Valley at the small Shan village of Pankham on the right bank of the Nam-Wun. Here the Chinese border is crossed; and about a mile further on, standing like an island of trees and gardens in the otherwise bare plain, is the village of Kutlung, consisting of about thirty Shan houses, a bamboo Kyaung or monastery, and a zayat in the Burmese style. Continuing to follow the road from here to Mung-Mau, the Nam-Wun is crossed about a mile to the eastward, at a point where it flows in a general southerly direction across the plain towards the Shueli, and in a stony tortuous bed. The average depth (in February) at the ford was about 2 feet, the breadth some 60 yards, and the current about 1 mile an hour; the banks of

the convex shore were thickly strewed with the trunks and branches of large forest-trees brought down by the floods after the rains, at which time both the volume and the velocity of the stream must be increased in a tremendous proportion. The distance from the ford to the point where the Nam-Wun emerges from the hills near Pankam, would be about 4 miles by the winding of the stream; above this emerging point I had only an opportunity of seeing about 3 miles of the Nam-Wun, and here it formed a powerful mountain-torrent dashing over rocks and shoals with a rapid current, and bounded on either bank by steep hill-sides or precipitous crags. That there can be no navigation on the Upper Nam-Wun is obvious; there is also no road following the course of its valley, except a slight track worn by the Shan fishermen near the water's edge, which enables a person on foot to make his way through the rocks and jungle, but which would not be practicable for any beast of burden. Fish of different kinds appear to be plentiful, and at this season of the year wild-fowl also.

The road from Kutlung to Sefan (and onwards) may be said to divide into two branches, or a loop, after passing the Nam-Wun, the one leading up the right bank of the Shueli to Mung-Mau and thence across to Sefan, the other crossing the Shueli at Nam-Kam, and conducting along the left bank to the same place. Of these two I take the latter to be the most frequented by traders, but in point of distance there is apparently no appreciable difference, while as regards the condition of the roads themselves, I am unable to draw a comparison, not having followed the first beyond Mung-Mau, or the second beyond Nam Kam. As far as Mung-Mau, however, but little aspiring to the name of road exists, there being in most places only a number of small tracks leading through the paddy-fields in one general direction, but broken off here by a swamp, there by a ditch, in a way that renders travelling on this level plain little easier than crossing the hills.

The distance from Kutlung to Mung-Mau is about 22 miles, and several moderate-sized villages are passed on or near the road, mostly surrounded by some kind of light stockade or low earthen wall. Mung-Mau itself is the capital of the Tsaubwaship;* and stands on open rising ground at a distance of about a

* Mung-Mau may be regarded as the modern representative of the Mungmaorong (i. e. Mung-maò-*lung*, or *great* M. M.) of Major Pemberton, and the capital of the ancient Shan kingdom of Pong, founded in A.D. 568. The site of the capital of this kingdom was changed several times, but all were probably within a few miles of the modern Mung-Mau, and bore separate names. Considering the flimsy nature of Shan architecture, there is, perhaps, little chance of tracing the old capital, though the Shan chronicles appear to be perfect enough to identify the sites approximately. But on this subject it will be best to speak in a separate paper.

mile from the river's right bank. It is protected by an imperfect brick wall between 500 and 600 yards square, and about 16 feet high, without either the bastions or embrasures usual in Chinese city walls, but backed by a light earthwork of about 10 or 11 feet in height. The gates are four in number, and stand at each cardinal point of the compass; but other openings occur, at intervals, for mere want of necessary repairs. No guns were to be seen upon the walls except old rusted "gingals," or Chinese swivel guns, mounted over the gates, and, as far as could be seen, there were no fortifications or defensive works of any kind outside the town. The buildings within the wall are inferior bamboo-huts without arrangement of any kind, and absolutely no suburbs exist. The population might be estimated at about 1600 or 1800 persons, all, except a few of the officials and soldiers, being local Shans, characterised, on the whole, by a dead-alive, slip-shod appearance.

Nam-Kam, near the opposite bank of the river, and some 20 miles lower down, is the chief town of the Burmese Shan Tsaubwaship of the same name, forming one of the thirty-nine *maings*,* or townships, of Theinnee. It is ruled by a Shan Tsaubwa, there being no Burmese officials or soldiers, except Shans, who appear to be mere townspeople or villagers from the neighbourhood, called in and armed with rusty matchlocks, as a check on the Kakhyens, who inhabit the hills in the vicinity, or who wander into the place on market-days with produce for sale, or bullocks for hire. The town is neither walled nor fortified in any way, if an imperfect bamboo stockade on the south and part of the west sides is excepted. The population is somewhat more mixed than at Mung-Mau, having a greater proportion of Chinese and Paloungs, but the whole would probably not number more than about 1500 persons.

The Shueli Valley, in form of a level plain, may be said, as far as I am aware, to have its upper limit only some 6 or 8 miles above the town of Mung-Mau, between that place and Luey-leik, and its lower limit, near the point where the river re-enters the hills in its course to the south-west; it would thus measure some 30 miles in length, with a breadth varying between 4 and 12 miles everywhere below Mung-Mau, though becoming gradually narrow above that place. Nearly the whole of this extent appears to be good arable land, though in some places there are swamps and watery hollows that point to the occurrence of inundations during the flood season of the Shueli; nevertheless, perhaps one-half of the entire area, exclusive of the river-bed, may be roughly estimated to be

* Theinnee is sometimes spoken of as containing 49 *maings*.

under cultivation, rice and tobacco being the staple products, though the poppy is also largely grown in its proper season, while around many of the villages, and especially those on the slopes of the hills on the Nam-Kam side, large fruit-gardens are met with, and fields of pine-apples. At the time of my visit the poppy was not in season. I therefore saw nothing of the cultivation of this interesting plant, and could obtain no information worth recording from the natives, regarding either it or the manufactured drug. The latter is, however, consumed almost entirely by the Shans themselves and the Kakhyens, but little finding its way into Yunnan proper. It is used by the Shans, as by the Chinese, in a thick, half-solid state, without plantain-leaf fibres, and is smoked lying on the side and in the ordinary Chinese opium-pipe. The lower slopes of the hills were pointed out as the land best suited for the poppy.

From a physical point of view, the most remarkable feature of this section of the course of the Shueli is its altitude above the sea, and consequently of the great fall the river must have in its course, towards the Irawady, thus proving, in the absence of an examination of the river itself, its entire incapability for navigation. For, taking the altitude of Nam-Kam, near the lower end of the valley, to be 2600* feet, and estimating that of its confluence with the Irawady (roughly) at 300 feet,† we should have a fall of 2300 feet to be accounted for within an approximate distance of 140 miles (allowing for winding), or about 16½ feet per mile. Indeed, the fall per mile would probably be even greater than this, for at the point where the Shueli and Irawady converge the hill-country is some 20 miles back from the latter river; the lower course of the former therefore flows through a level, or nearly level, plain for at least 20 miles, which would leave it only 120 miles in which to fall 2300 feet‡—a gradient of over 19 feet in the mile.

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* Note III.

† Or nearly 100 feet below Bhamo.

‡ It is possible that the Shueli may be navigable for large boats or small light-draught steamers on its course in the plains during a portion of the year.

Dr. Williams ('Through Burmah,' &c., 1868, p. 171) writes as follows:—

After inspecting the mouth of the river and ascending it for a few miles through an uninhabited tract, "The people at the village agreed in describing its course as exceedingly tortuous, and its channel broad and shallow, with numerous sand-banks. Between three and four days by boat from its mouth the river divides into two branches, the greater going by Momiet to the Shan country, and the lesser to Mogouk. . . . The great drawback to the navigation of the Shweyleo seems to be its shoals and sand-banks; but during floods there must be a considerable depth of water, admitting boats of heavy burden, and giving facilities to timber-rafts from the inland forests. . . .

Gutzlaff (in 'Journal of the Royal Geographical Society,' vol. xix. p. 44) speaks of the Shueli as the Lungchuen, and says that before it leaves Chinese territory, it receives the Kang-wan River, meaning probably the Nam-Wun, though the latter might itself be called the Lungchuen, if named after the town of Mowun, for the

Throughout its upper valley in the Shan States the Shueli flows in a wide, but generally well defined, shingly bed, and with a scarcely perceptible slope between the upper and lower ends of the valley: the altitude which I have fixed, therefore, for the neighbourhood of Nam-Kam (i. e., 2600 for the river itself) may be assumed without the probability of any considerable error to be the general altitude of the whole of its course through the valley.* At the ferry within a mile of the town of Nam-Kam the breadth of the river was about 100 yards, the average depth across some 4½ feet, and the average surface current about 1½ mile an hour by estimation. About 5 or 6 miles below this point, by the windings of the stream, it is joined by the Nam-Wun in a clean-cut, oblique, confluence, nearly opposite the village of Long-kong.† By a rough estimate it would seem that the Nam-Wun is equal in volume to about one-third of the Shueli, and the velocity in each about the same, viz., rather over 1 geographical mile an hour at this season. The point of confluence is only about a mile above the entrance of the river into the hills, which latter is in itself a remarkable feature, for a chain of hills, or long spur tailing off towards the east from one of the parallel cross ranges of the Kakhyen mass, leaves a secondary valley between itself and the continuation of the mountains which form the left side of the main valley higher up. The river appears to have unaccountably missed taking this secondary valley, to the south of the spur, and to have made its way along the northern side of it for about 2 miles; it then suddenly takes a turn to the south and breaks through the hills in a deep, narrow gorge or defile. On one occasion I proceeded along the right bank of the river from the Nam-Wun confluence to inspect this gorge, and it was evident that the influence of the Nam-Wun on the Shueli was one of velocity entirely, the volume being by no means increased after junction, for the breadth below was even less than above the confluence, and there was no appearance of increased depth. At the gorge itself this was even more conspicuous, the breadth of the stream there being narrowed to some 50 yards, and, judging from the lay of the rocks, no great depth. On the other hand, the velocity here was greatly increased, and must have been at least 4 geographical miles an hour at this,

latter is called by the Chinese Lung-Chuen. "Between these two rivers," he continues, "there is a small state called Maow, containing many extensive valleys, the population of which is wholly agricultural." See also Klaproth, 'Mém. relatifs à l'Asie,' vol. iii., p. 385.

* On the accompanying map Mung-Mau is marked 2690 feet, but the town stands on rising ground, upwards of a mile from the river.

† Probably the Lung-Han-quan of D'Anville's map; sometimes written Han-Lung-quan.

low-water, season. On proceeding down stream, or on approaching the river across the level country on its right, it is not until one arrives within half a mile of the hills that it is possible to see how the river flows, for one would never suspect from the appearance of the hills that it could break perpendicularly through them, as is actually the case. A small village and clearing stands just at the foot of the hills at the point where the Shueli breaks in, and a small stream from the westward, called the Mossi, joins the former at the same spot. From here a faint track leads along the hill-sides at some height above the water, but this appears to lose itself in the jungles at a short distance within the gorge. I followed it as far as I was able, and my last view of the elsewhere placid Shueli was that of a dashing rock-bound torrent, driving its way down through the mountains in a manner that sets finally at rest any question as to its navigability.

The scenery below the entrance of the river into the hills is remarkably wild, and I am informed that it continues to flow through almost uninhabited hill-tracts, until arriving on the plain of the Irawady. The falls and rapids along this section are described by the Kakhyens as occurring at intervals of every 5 miles, while about one day's journey below where I obtained my last view, a sheer waterfall of great height is spoken of, called Tat-pi-hai,* which is difficult of access from any direction on account of the rugged nature of the country around it.

The Mossi (some 10 yards broad and a couple of feet deep) is of no further interest than that it forms for some few miles of its course the border between Burmese and Chinese-governed territory (see Map). The distance up the Mossi to which the border here extends I have not been able to ascertain exactly, but it is, roughly speaking, to the point where the stream emerges from the Kakhyen hills, and consequently beyond which, towards the west, the Chinese Shan population does not extend; for the border generally on the Chinese side of the Shueli may be said to skirt the foot of the Kakhyen hills, and to include all the Shan populations, but none of the Kakhyens, these latter being entirely independent of both the Chinese and Burmese Governments.†

* A Shan name, literally *Rock-Nat-cry*, or the rocks that cause the Nats to cry, because they are unable to ascend them. I was never able to obtain any estimate of the height of the fall more nearly than that it was "higher than the highest tree in Nam-Kam," an estimate that I would not venture to turn into feet. The difficulty of access I do not believe in; it was probably invented by my interpreter, because he suspected, from my inquiries, that I wished to *visit* the falls.

† On all maps that I am acquainted with the Chinese and Burmese territories are shown as conterminous, and the Kakhyens are presumed to be subject to either one or the other. Whatever may be the case on the line of the Tapeng

Thus the border may be viewed almost as a natural one on the Chinese side, at least, for the tongue of territory formed by the Mung-Mau Tsaubâwship, jutting out to the westward from the general Chinese base, is bounded on one side by the Shueli and Mossi rivers, and on the other by the hills; while the races are sharply divided on the latter side by the same demarcation, into the valley-dwelling, agricultural Shans, and the Kakhyen hill-tribes; the villages of either, on its own side, extending close up to this natural border, but in no case, that I am aware of, over-stepping it.

The Kakhyens in this border region are clearly the dominant race, and come and go in the Shan territory as they please, attending the markets both as buyers and sellers, and frequently hiring the Shans as bullock-drivers, or porters for their produce; while on the other hand, the Shans never venture among the hills of their neighbours without an escort of Kakhyens, generally procured through the head of a protected village. Beyond the fact of Shans being Buddhists, and having a written language of their own (the Tai), these would appear to possess no great superiority of material civilisation over the Kakhyens. In their dress, their buildings, their domestic manners and customs, they have little or no advantage; and though their agriculture is more extensive on account of the position they occcupy on the plains, still the Kakhyens cultivate considerably for their limited numbers, and I imagine would equal the Shans in this respect did the configuration of their country admit of it. But in bravery, courtesy, hospitality, and probably also honesty, the Kakhyens are far in advance of the Shans of the Shueli Valley.

The Shan towns, so far as I saw them, being mere collections of bamboo cabins, without streets and without shops, cannot be regarded as even the local centres of trade, for they are only resorted to by the inhabitants of the surrounding country for the purpose of supplying their wants or disposing of their produce, on *every fifth day* when a market is held there; at other times they wear a half-deserted appearance. This system of five-days' markets, however, is not confined to the towns, for they are frequently held at or in the vicinity of small hamlets or near a cross-road.

River, certainly in the region I have visited they are entirely independent of both one and the other. Not only do they pay no tribute or taxes, but no Chinese or Burmese official can enter their hills without previously obtaining their sanction and safe-conduct; and were either Government to attempt to levy an impost or enforce a decree of any kind, they could only succeed after first conquering the tribes concerned. To the north of the Tapeng I believe the local tribes are equally independent, though on the line of that river—the main road between Tsikaw and Manwyne—intrigue, opium, and other influences, may have somewhat undermined this independent condition.

In the Mung-Mau Tsaubwaship below the town of Mung-Mau, there are four such localities* besides the town itself, and in the Nam-Kam Tsaubwaship there are also four† in addition to the chief town.

I had opportunities of witnessing two of these markets, one at Naung-to, near the village of Man-ai on the Mung-Mau, or Chinese side of the river, on the 14th of February; and the other at Nam-Kam on the 20th of February. In both cases a fair gathering of people had been brought together, the great bulk of them being local Shans, though there was also a considerable number of Kakhyens and Hill Chinese.‡ The objects for sale were chiefly eatables and chewing-stuffs, a little native cloth, and a few English piece-goods, such as red cambric, blue drills, grey T-cloth, and muslin; raw cotton (not ginned), brought down by the Kakhyen women, and a little cotton-yarn spun by these industrious people with a hand spindle, and chiefly as they walk along carrying their loads. Native-grown tobacco and wet tea are also to be seen in some quantities; and Liverpool salt, as well as the so-called Pegu salt, which latter I believe to be sea-salt, manufactured on the coast, near Rangoon. A few fruits, such as plantains, oranges, pine-apples, and dried persimmons, were exposed here and there; whilst fish (chiefly salt), and fresh pork and beef§ about complete the list.

It was impossible to obtain satisfactory lists of prices, owing to the suspicion and reticence of the people. At Nam-Kam, especially, the stall-keepers would have nothing to say to us, or would mention absurd rates ‖ when asked, with a view to getting

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* Man Vain; Hotone; Naung-to (Man Ai); Man-peng; Cutvain (Mung-Mau).

† Nong-mau; Mutsai; Tsai-Sain; Man-Wun; Nam-Kam.

‡ It is possible some of these latter may have been Lu-Saws.

§ In nearly every Shan village are to be found a few families of Palaungs, who in these parts are but lax Buddhists, and it is these who kill and bring to the markets all the animal food to be found there. In villages where no Palaungs reside, not only are beef and pork unprocurable, but also fowls and even eggs, though the fowls abound.

The Palaungs, however, in their own centres of population, such as the Toungbain district, are particularly pure Buddhists, but those dwelling among the Chinese and Chinese Shans have become corrupt, and forego many of the usages of strict Buddhists.

‖

	Tickal.
1 piece book-muslin	1
1 „ red cambric	5
1 „ longcloth	5
1 „ English carpet	8
1 „ blue drill	7 to 9
1 square (of width) woollen cloth	2
1 viss chilies	5
1 „ cinnamon	5
1 „ nutmegs	5
1 „ asafœtida	5
100 „ salt (viâ Bhamo)	10

(The tickal is usually reckoned in the regions at Rp. 1 12 an.)

rid of what they deemed dangerous customers. At Noung-to, however, we came upon these amiable people so suddenly, that that some few prices were obtained, as given on p. 212, and they will probably apply equally to all the markets of the neighbourhood, but must not be relied upon as entirely correct.

A great deal of the business in the five-day markets is conducted by barter, and everything—solid and liquid, dead and alive—is bought and sold by weight or by the piece, the Burmese weights only being in use. There is absolutely no coin current, though doubtless both English and Burmese rupees would pass by weight and at a discount on sycee, otherwise all trade, not barter, is carried on by means of Chinese (or block), silver weighed according to Burmese custom, in *viss* and *tickals.*

The absence of shops and of currency in any metal indicates a clumsy, rudimentary way of carrying on trade, and argues badly for the commercial spirit of the Shans. They are certainly industrious, as producers, but they are grasping, pusillanimous, and not particularly honest; a combination of qualities that belong rather to petty trade than to extensive commerce.

It would seem that all the trade between Burma and the Tsaubwaships of Nan-Kam, Mung-Mau, Sefan, Maingkwan, &c., is carried on by the Sawuddy route, and that the animals used, if the venture is a large one, are bullocks; or if a small one, usually ponies, the latter especially, if the traders or carriers belong to the villages near the western end of the Shueli Valley, for there considerable numbers of ponies are reared. There are no duties, either inwards or outwards, for the trade to Burma, but certain tolls are paid to the Lenna Tsaubwas on the passage through the hills. These are almost always levied in kind, and they appear to regard salt as the standard upon which all payments are reckoned: thus, on inquiring the rates prevailing, one is simply told that "100 loads of salt pay one load to the Lennas as transit duty, and everything else in proportion;" so that in fact about 1 per cent. may be estimated as the amount of transit-dues levied by the Kakhyens, between Sawuddy and the Shueli Tsaubwaships. These dues are occasionally paid by upward-bound caravans, at the protected village of Mansey, at the foot of the hills, but more frequently at Wurabhum, the chief (Palaungtu) Tsaubwa taking no part in the collection of tolls for the reason that his village is not on the main road. All downward-bound caravans pay at Wurabhum. For the trade with China—viz., at the other end of the valley—the Mung-Mau Tsaubwa, I was informed,* has a

* Not on very good authority.

custom-house where dues are levied to a very light amount and at no fixed rates.

The taxes paid by the inhabitants of the Tsaubwaships are farmed by the head of each village; i.e. the Tsaubwa assesses a yearly sum, supposed to be based on the amount of land under cultivation, and for this sum the village head-man is responsible; he again collects a fixed annual sum from each house or family, according to the proportion of land belonging to it; thus the rate which individuals have to pay varies with the varying size of the villages, and the tendency is for the inhabitants of small villages to emigrate to the larger ones, if good land is to be had, and share in the fixed yearly amount. At Kutlung, for instance, the Tsaubwas' assessment is 300 *tickals* of silver *per annum*, and there are usually about thirty families: if a family removes, those who remain have to pay a greater proportion; if others come, their burden becomes lighter.* It is said that Kutlung is an average example of the villages of the Shueli Tsaubwaships, and if this is the case, the incidence of taxation is sufficiently high; for assuming, on the average, that in each family there are three self-supporting members, the yearly amount paid by each (tick. $3\frac{1}{3}$), reaches rupees 5.13 *ans.* (exclusive of children), taking the tickal, as is usually done in these parts, to be worth rupees 1.12 *an.* There appear to be no other taxes direct or indirect, levied either by the Tsaubwas or the Chinese Government, though I believe some very insignificant payments (in produce), are made to the Kakhyens by the villages which enjoy their protection, as in the case of the Burmese villages on the other side of the ranges.

NOTE I.

The most northerly of the routes above referred to are two in number, and though but little used at the present day, it is possible that in the earlier times one of them at least may have been a common high road between Yunnan and the Irawady, and certainly the shortest traverse from Momien and the neighbourhood, to practicable navigation on the Irawady. By either the distance is performed by ordinary travellers, on foot, in about six days, or, if on horseback, in five days and even less.

On the more southerly of the two, the travellers utilise the lower portion of a left tributary of the Irawady called the Namthabet, a small stream falling into the great river a short distance above Talo.

* Of course within certain limits only; for if a village increases greatly in population, the Tsaubwa soon becomes aware of the fact, and raises his assessment.

	Days.
Thus, from Momien to a town called Ta-Chansi is	2
From Ta-Chansi to Siaou-Chansi	3
From Siaou-Chansi to village on Namthabet	1
	6

Here boats can be procured to descend the Namthabet to the Irawady.

By the more northerly of the two roads, the itinerary given is as follows:—

	Days.
Momien to Ku-Yung	1
Ku-Yung to U. Chiung	2
U. Chiung to Sidon	1
Sidon to Kampti	2
Kampti to the Lemio village on Irawady	0½
	6½

From Sidon to the Irawady there is, however, a short track which requires less than 2½ days to traverse, but to what precise point it leads I have no information. Neither have I any but contradictory information regarding the country through which these routes pass, of how far back from the river the plain extends, or of the nature of the hill-tract beyond.

It is therefore almost impossible to say whether either can be the route on which Marco Polo describes the great descent of 2½ days' ride, leading to the forests of Mien; but one of them would certainly appear to point to the road travelled by the 20,000 to 30,000 fugitives from Yunnan-foo to Ava in the year 1687 (as mentioned in Vol. 6 of 'Acad. Royale des Sciences,' 1736, and in Yule's 'Marco Polo,' ii. p. 72, 1st ed.).

Their itinerary gives :—

	Days.
From Yung-Chang to Momien	4
From Momien to a village where they embarked for Ava ..	5
	9

Certainly one day less on the last stage than either of the above itineraries, but still quite feasible in that time, though somewhat out of proportion with four days from Yung-Chang to Momien as laid down on the Maps.

Ta-Chan-si is a "great market," such as Polo describes; but as there are also other great markets on the Tapeng and Shueli routes, this will hardly help to connect it with Polo's route.

Robinson ('Descriptive Acct. of Assam,' 1841, p. 247), mentions a route in this neighbourhood starting from a place called Katemow on the Irawady, and refers probably to the Namthabet line.

NOTE II.

The Kakhyens.

A note on the Kakhyen, or Singpo race, in a general sense, would occupy too much space, and be far beyond the scope of this short paper; I propose, therefore, only to glance briefly at what is known of their origin, or early history.

In the absence of a written language, it is at all times exceedingly difficult

to obtain trustworthy or even consistent accounts of savage tribes, but nevertheless several attempts have been made by English travellers, and though the results differ very considerably *inter se*, still a general outline of agreement regarding the descent of the race remains; and this, I believe, I have the means of confirming and slightly extending.

The only two entirely original accounts that I am acquainted with are those respectively of Major S. F. Hannay,* who visited the Singpos in 1827, and of Captain John Bryan Neufville, whose explorations among the tribes bordering on Upper Assam extended approximately from 1825 to 1828;† both are necessarily brief, and as both refer chiefly to the Singpos proper, or those occupying the slopes of the Pat-koi range and the right side of the Irawady valley above Magáung, comparatively little light is thrown on the more southern clans, sometimes known as the Kakoos, and whose homes are chiefly beyond the left bank of the great river.

It is these latter mainly who are known to the Burmese, and who have been named by them Kakhyens; in all probability they are looked upon as an inferior race by their more northern brethren, the Singpos proper but still they are in no way subject to the latter, or even oppressed by them, while their language, customs, and traditions are essentially the same; and as regards civilisation, one division would probably be about on a par with the other.

The Kakhyens (for such it will be most convenient to call the Kakoos) besides being subdivided into numerous clans or sub-tribes, are sometimes roughly spoken of as Kakoo-Kanams, or upper and lower Kakhyens (from Ka = water, Koo = upper, and nam = lower), though this division implies no distinction in the blood-relationship of the clans, but merely a general designation of the positions they respectively occupy with regard to the Irawady. The dividing-line is generally indicated, though somewhat vaguely, as the Kyonkdwen, or third defile of the Irawady; but this is of little importance, as most of the Kakhyen clans change their positions considerably in the course of a generation or two—the tendency being to press towards the south. At the present day all the Kanam, or lower Kakhyens, point to the north as their original habitat; and I am credibly informed that at the time of the present King of Burma's accession to the throne no Kakhyens existed within the Government of Momiet; whilst at the present day large numbers are to be found there, and at other places south of the second defile of the Irawady. They also appear to migrate somewhat in a westerly direction, but in a minor degree among the southern clans at least; though among the Singpos proper, on the upper Kyendwen, &c., a decided westerly tendency was observed by both Captain Neufville and Major Hannay.

As far as my information goes, no mention of Kakhyens or Singpos is to be found in Burmese writings—whether histories, dramas, or what not—until very recent times; and perhaps the earliest mention of them, in any written language, may be that contained in the Shan histories of Mung-Mau and Mogaung, or, possibly, in Ahom‡ books describing the same events as those treated of by the Shan historians.

The country at present occupied by the Singpos and the more northern of the Kakoo tribes, would seem formerly to have been inhabited by the Noras, a tribe of Shan-kinship, and, indeed, a branch of the great Tai race. These appear to have been a valley-dwelling, agricultural, and comparatively civilised people, and to have occupied, besides the Kakhyen country of the present day, the whole or nearly the whole of Khamti, which at that time extended far beyond the present limits towards the south-west, and was divided into two

* 'Sketch of the Singphoo,' &c., p. 49. Calcutta, 1847.

† 'Selections from the Records of the Bengal Government,' No. XXIII. p. 17. Calcutta, 1855.

‡ *I.e.* the descendants of the Shan invaders settled in Upper Assam.

provinces called Ai-ton and Ai-kham.* In about the year 1225, Chau-Kaa-pha, the King of Mung-Mau, or Pong, undertook the conquest of the Noras as part of his scheme for the subjection of Upper Assam; his army was commanded by his younger brother, Sam-lung-pha; and it is in the records of this campaign that the Kakhyens are first mentioned. No State or Kingdom appears to have existed, but a person called a Singpo-pawmine, dwelling among the Noras of Ai-Kam is said to have rendered some assistance to the conquering commander. It is impossible to point out the precise locality where the pawmine was met with; but as Sam-lung-pha's march was from Mogaung to a point on the Upper Bor-Dihing, he probably discovered the Singpos somewhere on a line drawn directly between those two places, and if this is the case, both the date and the locality of this first appearance of the Kakhyens would coincide with their own traditions as related at the present day, so far as regards their history, though but little light is thrown on their origin, or on the manner in which they sprang into existence among the alien and less barbarous race of Noras.

Captain Neufville gives three cosmogonies as derived from three separate Singpo chiefs; and I have myself heard from the lips of their more southern brethren absurd and fabulous attempts to account for the origin of their race; but as a record of such childish legends, especially when no two agree, can scarcely serve any useful purpose, they need not be further alluded to. The least fabulous and most consistent of those quoted by Captain Neufville, and the one which he says he prefers to follow, is that related by the Bisa-Gamu, and which, as will be seen below, bears out, in a remarkable degree, the deductions to be drawn from a pedigree of one of the most intelligent and, perhaps, the most powerful chief among the Kakoos, or southern Kakhyens, viz. the Maten-Tsau-luna of the Cauri clan. The chief visited in Bhamo in 1873, together with a number of his sub-chiefs, or pawmines, and caused his pedigree to be put into writing by an educated and highly intelligent Assamese, then attached to the British Agency, and from whom I have received it.

The Bisa-Gamu's account, divested of fable, is to the effect that the Singpos were originally established, and indeed created, on a plain at the top of a mountain called Mujai-Singra-Bhum, situated at a distance of two months' journey from Sudiya, between the country of the Bor Khamtis and the border of China, and washed by a river called Sri-Lohit, flowing in a southerly direction to the Irawady. Here the whole race was devoured by the Rakhas, or demons, with the exception of a man named *Siri Jia*, and his wife Phakrat; or, in other words, the Bisa-Gamu pointed to Siri Jai as the founder (or Adam) of his race, and stated that *twenty-one generations* had passed away since the time of Siri Jia's existence, i.e. nearly *twenty-three* generations up to the present date.

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* Ai-Kham to the north and Ai-ton to the south. The record of the Noras being a people of comparatively advanced civilisation is borne out by the fact that to the present day their few remaining descendants, who dwell chiefly in Upper Assam and in Mogaung, are looked up to as an hereditary learned class, and are employed chiefly as astrologers among the Buddhist priesthood. Ritter ['Karte von Assam, Ost-Bengalen,' &c., 1840] has apparently confounded the Noras with the Nagas—called by the Bur-Khyeng and by the Shans Khang. Though a numerous and widely-extended race, embracing most of the clans of hill-men [except the Singpos] from the savage war of the Gorlan-si-gong mountain in the east to the Looshais and Shindus in the west, the Nagas have always been barbarous, predatory hill-men, and can have had little or nothing in common with the Noras. (The question of a connection between Nagas and Karens, however, is worth investigating.)

Major Pemberton tells us that even in his day the Magoung Tsaubwa was called by the Singpos and other hill-tribes "the Nora Rajah." ('Report on Eastern Frontier of British India,' 1835.)

The Maten-Tsau-luna's pedigree it will be most convenient to trace downwards. Divested of all fable, he locates the birthplace of his race to the east of the Irawady, and on the southern border of Khamti; and ascribes the splitting-up that subsequently took place to the custom that allowed the chiefs to take to themselves an unrestricted number of wives.

The first man (or Adam) was called Ja-kum-sa, a name containing, as near as possible, the *Jia* of the Bisa-Gamu. Ja-Kum-sa had but one wife, whose name, however, is not given by the Maten.

The list then runs thus:

1. Ja-Kum-sa, one wife.
2. Ja-Ro-wa, son of the last, one wife.
3. Sodo-Wa-modu, son of the last, two wives.
4. Ana-Wa-ting-Sa, son of the last, one wife.
5. Kum-song-ma-sa, son of the last.
6. Wa-Kyet-Wa, son of the last, thirty wives; four of whom only are known by name. One of these, called Mogun-Hopan-Mosan, had eight sons, forming the eighth generation from Jā-Kum-sa, as follows:

1. Mirip-Wa-Kum-Sa. Wa signifies father, thus, "Kumsa, the father of the Mirips." He inherited his ancestors' dominions, and became the first Mirip Tsaubwa proper. His brothers were scattered over the country, and formed clans for themselves, as follows:
2. Lataung-Wa-Lalong, or father of the Lataungs.
3. Lapai-Wa-Lai-song, father of Lapais.
4. Chu-Hung du, Ti-Yau, otherwise "Lakun Wa," or father of Lukuns. *Du* signifies chief.*
5. Meran-Tang-Nung-Sang, or Nung San of the Meran village, who became father of the Merans.
6. Yaw-Kum, Yong-ten. *Kum* means chief, thus: Yong-ten, chief of the Yaw village. His descendants became Lakuns.
7. Ha Su Latoung. Ha Su's race became Latoungs.
8. Meran Wa-Sroi, father of Merans, named Sroi.

Thus from these *eight*, there result only *four* principal clans, though each one is subdivided into two, viz.:

1. { Mirip Lapai,
   { Lai Song Lapai.

From the Mirip Lapais the Singpos proper are supposed to be descended. They are sometimes known as Sadan Lapais.†

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* The word Tsaubwa usually applied to Kakhyen Chiefs, it may be mentioned, is a Burmese corruption of the Shan title of Chau-p'ha, or as generally written in modern English documents in Siam, Chow-fa, *i.e.*, *Chau*, Lord, and *p'ha*, ruler). *Gaum* (Kum) and *Du*, I believe to be the true Kakhyen titles for their chiefs. Pawmine, in like manner, is a corruption of two Shan words, *Paw* or Po, father and *maing*, noble, or ruler.

† Possibly the *Tesan* of Major Hannay, who gives (p. 7) the five principal tribes into which the Singpos or Kachyens are divided:—

Tésàu, Mirip, Lophae, Lûtong, and Mayrung. The spelling is his. But he adds that there is also another clan on the borders of Assam, east of Sudiya—the Luttera Kakoos, also called Lessoo, who came originally from the Chinese frontier, and whom he cannot regard as a distant tribe as their language is "essentially that of the Kakhyens." These are doubtless the Leesaws or Lissus, who are, in fact, a kindred tribe to the Kakhyens, but not entirely of similar race, and certainly not a Kakoo clan, as might be inferred from the name as given by Major Hannay. The language of the Leesaws, however, who inhabit the border country, near Momien, &c., is not the same as that of their Kakhyen neighbours.

2. { La-long Lataung,
   Ha su Lataung.
3. { Ti-Yau-Lakun,
   Yong ten Lakun.
4. { Nung Lang Meran,
   Sroi Meran.

It is from the third son of Wa Kyetwa, or the second division of Lapais (Lai Song Lapais), that the Maten Tsaubwa traces his ancestry, which may be arranged as under:

1. Ru Kong Ni, son of Lapai. Wa Lai Long.
2. Si Yong du Takong, son of the last, chief of the Takong village.
3. La Sau, son of the last.
4. Midi du, *idem.*
5. Lapai Ladin, *idem.* He had four wives and five sons, the youngest of which latter, or the Homa, succeeded his father. *See* No. 6.
6. Au Ka Taung, son of the last. He had three sons, the youngest of whom was No. 7.
7. Sam Si Na, son of the last. He had two sons, the elder called Singpo Krong, and the Homa, called Mung-tung-la. The Homa did not succeed in the usual course, however, on account of some irregularity in the marriage of Sam Si Na.
8. Singpo Krong. Had a son called Lung Yang. At Singpo Krong's death, Mung-tung-la married his widow, by whom he had two sons. These two, together with Lung Yang, then became Assi-Lapais. Mung-tung-la also, by another wife, had a son called Cauri Nong, whence the Cauri Lapai (Couries). Thus, following the Cauri branch, we have:
9. Cauri-Nong. Had two sons (1) Tomudu, surnamed Ning-gon-Wa, and (2) Homa Tang, who, with their descendants, split up the clan into a number of subdivisions or villages, which it is not worth while to follow, though fully detailed by the Maten. The present Maten Tsaubwa is the sixth generation after Cauri Nong under Tomudu's line, or the twenty-second generation from Ja-Kum-sa.

By this account of his ancestry, therefore, it will be seen that the Maten Tsaubwa agrees with the Bisa-Gamu in three important points, whilst the record of the Shan general's campaign assists in bearing out one of them—the third. The three points are: the name or designation of the founder of the race, the locality from which it sprang, and the length of its existence as such. The coincidence, moreover, is remarkable as showing the care and thoroughness with which traditions are handed down by races who have no knowledge of a written language,* and who are therefore conscious of having nothing to fall back upon in case of the thread of the tradition once being broken.

As a subject somewhat remotely bound up with their history, it may be worth while to give the following list of the *Nats*, that is, the gods, or spirits, worshipped by the Kakhyens; for, if viewed in the point of a connecting link with their Hindoo neighbours in Assam, it will be seen that some slight impression has been made by contact with the latter, and that so far a few, at least, of their Nats may be traced either directly, or through the Shans or Burmese, to Hindoo mythology; while further investigation of their traditions, &c., might bring to light even closer connection. Major Hannay tells

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* The Kakhyens of the Lenna clan, indeed, pretend that they formerly had their history written on buffalo-hide; but that portions of it were, from time to time, offered up as sacrifices to the Nats until none remained. Such a statement, however, is not seriously to be taken into account.

us (p. 5) that great deference is paid to the priests of the Buddhists, and also that it is not uncommon to see converts to that faith. To the latter statement I cannot answer; but certainly both the priests and the religious edifices of the Buddhists are treated with respect by the Kakhyens, and when a Burmese or Shan village is sacked by them the temples and monasteries are usually spared. Over the graves of their chiefs, moreover, are to be seen bamboo erections in the form of Chinese Buddhist temples; but further than minor evidences, such as these, of the influence of their Buddhist neighbours, the Kakhyens I have visited possess nothing to bear out Captain Neufville's statement (p. 9) that their "ostensible worship is that of Gautama, whose temples and priests are found in all their principal villages."

That this may be applicable to some of the Singpo clans bordering on the Shan settlements of the Hukung valley and Khamti, I will not deny, but I prefer to accept another statement of Captain Neufville's (scarcely consistent with the last) to the effect that their religion is made up of a mixture of all the various idolatries and superstitions of the nations with whom they have intercourse; and if this is the case the same conclusion is again arrived at, viz., that their religion is to a great extent derived from a Hindoo origin, for all the nations in immediate intercourse with the Kakhyens appear to have borrowed the major part of their "idolatries and superstitions" from the Hindoos.

The twenty-four chief Nats are as follows: though there are innumerable inferior and local ones. Indeed, it is probable that several of the following are merely local among the Cauri and neighbouring clans:—

(1.) *Mo-Nat.*—God of heaven, and the most important of all.

(2.) *Monauk Monaung.*—The object of royal worship, i.e. the Nat whom only chiefs may worship, and that only in a number together; neither a single chief or any number of common people can sacrifice to him. It seldom happens that he is worshipped, but when an occasion is found it is made an opportunity for great feasting and ceremony—sometimes extending over a month or more. Monauk Monaung ranks next in importance to Mo Nat; the third being

(3.) *Maw-Pit-Wa.*—Father, or King of the gods. The Thegya-men of the Burmese, or the Indra of the Hindoos. Maw-Pit-Wa is regarded as dual; existing, that is, as husband and wife—the husband individually being called Cha-Ru-Wa, and the wife Madai-Frong-Nga. Maw-Pit-Wa is not worshipped by single individuals, but only by whole villages at a time, and on great occasions, such as harvests, building new houses, &c.

(4.) *Nun Gon Wa*, or Nun-Kwan.—The god of the creation of the world; the Bya-Ma of the Burmese, or Brahma of Hindoos. He is sacrificed to (in conjunction with other nats) on going into battle, and in some cases of sickness—the sacrificial objects being silk body-cloths, flour, water, &c., but no animals.

(5.) *Ng-Ka.*—The Nat of the earth.

(6.) *Tsaw Tung.*—The Nat of the forest.

(7.) *Sam Nat*, or god of the sun.—A very important Nat, who can only be approached by a whole village assembled, with the Tsaubwa at their head. After harvest is the usual occasion for worshipping the Sam Nat, but on other great occasions also.

(8.) *Sada Nat.*—The god of the moon.

(9.) *Warum.*—God of disease; i.e. the Nat who gives disease. He is sacrificed to in all cases of grave sickness and epidemics; the sacrificial objects being exclusively animals, but animals of various kinds. In connection with this Nat, it may be mentioned that the Kakhyens have no doctors and no medicine, a fact that the following tradition, related to me by a Lenna Pawmine, will illustrate: "In the beginning, Nun Gon, or Nun-Kwan, gave all

the nations medicine-seed, which they all took to their respective countries and sowed. The Kakhyens sowed theirs in the hills, but as soon as it came up the buffaloes ate it; then they tried it in the plains, but the pigs and rats came and ate it; and lastly they tried to grow it close to the water's edge, but here the fish used to jump out of the water during the night and devour all the medicine as soon as it appeared above ground. Thus there was no more medicine left, and no scope for doctors. Therefore, when a person falls ill they appeal to the *mitwei*, or priests, who find out what animal's ancestor ate the particular medicine good for the disease in question, and recommended the sacrifice of one of its species for the cure of the sick person; that species of animal being responsible for the want of the necessary medicine." The sacrificial ceremony is accompanied by dancing, music, and a number of grotesque proceedings.

(10.) *Ng-Ku.*—The house Nat, existing in a dual form as male and female.

(11.) *Ng-dong.*—The Nat who guards the outside of houses.

(12.) *Kakoo-Kanam Nat.*—The spirit of the waters. He is sacrificed to when a person is drowned, and sometimes in cases of disease.

(13.) *Pi-lo-mum.*—The Nat that resides in man for evil purposes—an evil spirit. The Sung of the Burmese, or Daken of Hindoos. A person suspected of being possessed of Pi-lo-mun is generally expelled the community.

(14.) *Num Siang.*—The god of the village, existing in dual form, as one male and one female. The male guards the village on the east side, and the female on the west. Num Siang is sacrificed to on going into battle, building new villages, &c.

(15.) *Bhum Nat.*—The spirit of the hills.

(16.) *Mam-Somla Nat.*—The spirit of the paddy-fields.

(17.) *Ning-poi, or Mbung-poi.*—The spirit of the air. He is worshipped on every variety of occasion, and usually in conjunction with other nats. Animals are sacrificed to him.

(18.) *Lakang.*—The nat who guards steps and doorways (not the same as No. 10).

(19.) *Ng-kau.*—The ancestral Nat. He guards the posterity of the family, and is worshipped every day indoors.

(20.) *Ng-dang.*—A female Nat. The ghost of women who die pregnant.

(21.) *Lessa Nat.*—The ghost of dead men. The Burmese Tesei. His name is a term of abuse among Kakhyens. In sacrificing to him they offer only a piece of the burned skin of some animal and a little food.

(22.) *Ko Kam La Nat.*—The spirit of a Burmese king, who, after death, came to a Kakhyen village and became a Nat. He is sacrificed to in some cases of sickness.*

(23.) *Kaw Saing Nat, or Haw Seng.*—The God of China.

(24.) *Saga Nat.*—The protecting spirit of the garden. When sacrificed to, he is offered two fowls, a little native whisky, and some tobacco.

During the short time spent in contact with the Kakhyens I was frequently struck with points of resemblance between them and the "Gold-teeth,"† mentioned by the old authors, though the locality in which they are found, and the absence of the characteristic custom of covering the teeth with gold, prevent the Kakhyen or Singpo tribe from being identified with the Gold-teeth. The geographical position of the Kakhyens, also, is at present farther

* The name of the king I have not ascertained, but the Nat is probably a local one, the king having been raised to this rank for some special deed. This is frequently done with great personages, and Major Sladen, after his expedition to Momien, in 1868, is said to have been "beatified" in this way, by one of the clans, and thus now exists as a Kakhyen Nat.

† The *Zardandan* of Marco Polo and Rashid-Uddin, and the *Kinchi* of the Chinese writers.

west than that indicated by Marco Polo;* but this, in itself, perhaps, presents no great difficulty, for we have seen that the Kakhyens, though not a wandering people, change their position very considerably in the course of time. Still they have no tradition that I am aware of, of having come from so far east as beyond the Salween, where the Gold-teeth appear to have been located. But it will be best to take the chief points in Marco Polo's account of the customs, &c., of the Gold-teeth in regular succession, and compare them with those of the Kakhyens.

1. The Gold-teeth tattooed their arms and legs. The Kakhyens resemble them in this to a slight extent; but tattooing is not a universal custom with them.

2. The custom of "couvade," I believe, does not exist among the Kakhyens, at all events I have never been able to hear of it.

3. The Gold-teeth ate raw and cooked meat and rice, and drank rice-wine. I am not aware that the Kakhyens eat raw meat; but they have no prejudices regarding food, and will eat almost anything. Their drink is rice-wine, as described by Polo.

4. Gold. The Kakhyens appear to have little or no gold; and I cannot help thinking that if gold had at any time been as plentiful with them as Marco Polo relates of the Gold-teeth, some traces must have remained in their ornaments, or in their mode of trading, to the present day. On the other hand, gold is mentioned by Hannay as occurring on the borders of Khamti and China, or to the north and east of the Kakhyen country proper.†

5. The Gold-teeth had "neither idols nor churches;" and in this respect, as we have seen above, they resemble the Kakhyens.

6. No "letters or writing" existed among the Gold-teeth. Again a point of resemblance.

7. The climate in the country of the Gold-teeth was extremely unhealthy; but the climate of the Kakhyen hills is not reckoned unhealthy, though the regions to the eastward of the Upper Shueli, and about the Salween valley, are notoriously so.

8. The practice of cutting notches in a piece of stick, and then splitting it, so that one-half may be retained by each of two parties to a transaction, is a prominent point of resemblance in the customs of the Gold-teeth and the Kakhyens. On placing the two halves together, the notches correspond exactly, and the token is regarded as a pledge of good faith.‡

9. The Gold-teeth had "never a leech," but when a person fell sick they appealed to "Devil Conjurors," or "Keepers of the Idols." This striking point of similarity is illustrated by the note I have given above in connection with the Nat "Warum," No. 9. The Devil Conjurors or priests [they are not precisely keepers of idols, as there are no idols] are called *Mitwei* at the present day, and are to some extent, if not entirely, a hereditary class.

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* See Yule, ii. p. 69, 2nd edition.

† See Pemberton's Abstract of Hannay's Journal in 'Selection of Papers regarding the Hill Tracts between Assam and Burmah,' &c. Bengal Select. Pap., 1873, p. 104.

‡ When the Political Agent at Bhamo and myself wished to cross the territory of the Lenna Kakhyens to the Shueli Tsaubwaships, the Lenna chief sent us a piece of split bamboo, about 3 inches long, with two notches cut across it. He himself had retained the counterpart, the notches in which, we afterwards found, corresponded exactly with those in the half we had received; and we were assured that with this token as a passport we should be well received in any part of the Lenna territory.

The use of bamboo tally-sticks for counting is common among the more Southern Kakhyen tribes, and possibly among others also.

10. Sheep are mentioned by Marco Polo as existing among the Gold-teeth, but the Kakhyens have no sheep. Further to the eastward, within the Chinese border, however, there are sheep.

From this comparison it will be seen that though the Kakhyens, as they exist at present, have many points of resemblance to the Gold-teeth, as described by Marco Polo,* there are still several reasons why we should look more to the eastward for any representatives of that race that may yet be in existence. Besides the fact that the Kakhyens occur only to the westward of about the 98th degree of longitude, while the Gold-teeth were considerably to the eastward of that line, with their capital at Yung-chang,† nearly all the above points in which the two races do *not* agree, indicate a more easterly locality than that inhabited by the Kakhyens; while those in which they do agree are sufficient to show that the Gold-teeth must have been a kindred race to the Kakhyens, and about on a par with them in point of civilisation.‡ The only tribe that I know of answering to these general conditions is that of the Leesaws; and though, in the absence of any personal knowledge of them, I would not venture to do more than suggest an investigation of their traditions and customs to future travellers, still it may be worth while to mention that, so far as I have been able to ascertain, the Leesaws have much the same manners and customs as the Kakhyens, though they trace their descent from a different origin, and regard the western part of Yunnan as their native country.§ They extend, at the present day, as far west as the Tapeng valley; and in features, costume, arms, &c., so nearly resemble the Kakhyens of that neighbourhood, as scarcely to be recognised as a separate people. Further towards the north and east, however, they are more distinguishable as a separate race.

Note III.

Route Surveys.

The accompanying map was compiled from rough traverse surveys while on the march along the lines marked in red. On arriving at Mung-Mau, the note-book in which all the particulars of the survey had been entered was, together with a number of objects, stolen. The figures, however, had previously been worked up in a rough book, and thus the "skeleton" remained, though the details were lost. The distances, therefore, given in the itinerary on the map must be looked upon as approximations only.

The longitude adopted for Bhamo (97° 8′) rests on that of Mandalay, being 96° 4′ 38″. A difference of 1° 1′ was determined between the two places by means of two good watches, carried by steamer from Mandalay to Bhamo in eight days; but from all considerations I have assumed a diff. long. of 1° 3′, which places Bhamo in 97° 8′ (to the nearest whole minute).

* No other works that make original mention of the Gold-teeth are accessible to me.

† See Col. Yule, 'Marco Polo,' ii. p. 73, 2nd edition. Garnier also (i. p. 479) mentions, on the authority of Amiot, that the Shan name for the Gold-teeth was *Ouan-tchang*; while the Shan name for Yung Chang-foo is at the present day *Wan-chang*, the *Von-chan* of Polo.

‡ Col. Yule (as above) remarks that they were evidently distinct from the Shans, not Buddhists, and without literature; and thinks that probably they were a Kakhyen or Singpo tribe existing within the borders of China.

§ I have the authority of the Kakhyen Tsaubwa of Ponlyne for these two statements.

The altitude of Bhamo is based on corresponding readings, at the same dates of the two previous years, at the Harbour-master's Office in Rangoon. The barometer* was set up and read for about two months together with two aneroids (tested at Kew), while three boiling-point thermometers (also with errors determined at Kew) were frequently compared with it. The altitudes on the route across the hills are from the aneroids, and those in the valley of the Shueli from the boiling-point thermometers and aneroids together; the former having been boiled, and the latter read regularly at the change-hours of the day for several days at Kutlung and Nam-Kam. The circumstances under which it was necessary to camp, and the behaviour of the people, prevented the barometer ever being set up, except at Bhamo. Both the thermometers and the aneroids gave remarkably *consistent* results, and I believe the altitudes are fairly correct.

The magnetic variation determined at Bhamo and Sawuddy may be assumed as for one and the same station, the two places being only 9 miles apart in direct distance. The results of the sight at Mung-Mau being so near those of Bhamo, the variation for the entire map may be taken at 3¼° easterly.

The following are the observations used in the map, all calculated by Mr. William Ellis, of the Greenwich Observatory :—

Bhamo.

Latitude by Meridian Altitudes S. of the Zenith.

		°	′	″
1874. Dec. 8.	β Orionis	24	15	57
,, 8.	Sirius	24	15	55
1875. Feb. 9.	β Ceti	24	16	11
,, 9.	Sirius	24	15	56
	Mean	24	16	00

Latitude by Pole Star out of the Meridian.

	°	′	″
1874. Dec. 8.	24	16	25
,, 9.	24	16	17
,, 13.	24	16	00
,, 18.	24	15	43
1875. Feb. 8.	24	16	25
Mean	24	16	10
Mean of S. and N. .. Lat.	24	16	5 N.

Mansey.

Latitude by Meridian Altitudes of Sun.

	°	′	″
1874. Dec. 20.	24	6	56
,, 22.	24	6	25
Mean (observation S. of Zenith only)	24	6	40 N.

Sawuddy.

Latitude by Meridian Altitude S. of Zenith.

	°	′	″
1875. Jan. 28. Sirius	24	9	13 N.

* Captain C. George's patent.

Wurabhum.

Latitude by Meridian Altitude S. of Zenith.

1875. Feb. 11. Sirius	23°	59′	35″	N.

Palaungtu.

Latitude by Meridian Altitude S. of Zenith.

1875. Feb. 12. Sirius	23°	56′	4″	N.

Kutlung.

Latitude by Meridian Altitude S. of Zenith.

1875. Feb. 13. Sirius	23°	52′	42″	

Latitude by Pole Star out of the Meridian.

1875. Feb. 26.	23°	52′	49″	
Mean of S. and N.	23	52	45	N.

Mung-Mau.

Latitude by Meridian Altitude S. of Zenith.

1875. Feb. 15. Sirius	24°	0′	41″	

Latitude by Pole Star out of the Meridian.

1875. Feb. 15.	24°	0′	58″	
,, 17.	24	0	39	
Mean	24	0	49	N.
Mean of S. and N.	24	0	45	

Nam-Kam.

Latitude by Meridian Altitude S. of Zenith.

1875. Feb. 24. Sirius	23°	50′	5″	N.

Mung-Mau.

Longitude by Lunar Distances.

1878. Feb. 15.	Aldebaran 1st set. Moon E.	98°	10′	15″
,,	Aldebaran 2nd set. Moon E.	98	14	0
,,	Regulus 1st set. Moon W.	98	5	0
,,	Regulus 2nd set. Moon W.	97	58	15

Mean, Moon E. 98° 12′ 8″. Moon W. 98° 1′ 37″.
Concluded Mean 98° 06′ 53″.

Bhamo.

Magnetic Variation.*

1874. Dec. 15. Obs. *East* of the Meridian	3°	48′	Mean. 3° 35′
1875. Feb. 4. ,, ...	3	22	
1874. Dec. 15. Obs. *West* of the Meridian	2	54	Mean. 3° 1′
1875. Feb. 5. ,, ...	3	8	

Mean of East and West = 3° 18′.

* North end of needle deviating to *East* of astronomical north.

Sawuddy.

Magnetic Variation.*

1875. Jan. 28. Obs. *East* of the Meridian	3°	13′
1875. Jan. 30. Obs. *West* of the Meridian	2	29

Mean of East and West = 2° 51′.

Mung-Mau.

Magnetic Variation.*

1875. Feb. 14. Obs. *East* of the Meridian	3°	35′
1875. Feb. 15. Obs. *West* of the Meridian	2	52

Mean of East and West 3° 14′.

TABLE OF OBSERVED LATITUDES, LONGITUDES, and ALTITUDES.

Place.	Lat.			Long.		Altitude.	Remarks.
Bhamo (Residency)	24°	16′	5″	97°	8′	430	River level = 390 ft.
Sawuddy	24	9	13	..		..	
Mansey	24	6	40	..		440	
Wurabhum	23	59	35	..		4240	
Palaungtu	23	56	4	..		4490	
Pass, on direct road		..		..		5220	
Kutlung	23	52	45	..		2654	
Nam-Kam	23	50	5	..		2630	River level about 2610 ft.
Mung-Mau	24	0	45	98	7	2690	Centre of town.

Position of Mandalay.†

Latitude by Meridian Altitudes.

	S. of Zenith.			N. of Zenith.		
	°	′	″	°	′	″
1874. Oct. 3. Fomalhaut	21	58	43		..	
,, ,, 5. α Cassiopia		..		21	59	18
,, ,, 7. Fomalhaut	21	58	22		..	
,, ,, 9. Fomalhaut	21	59	7		..	
,, ,, 10. Fomalhaut	21	59	2		..	
,, ,, 10. α Cassiopia		..		21	59	30
,, ,, 12. α Cassiopia		..		21	59	35
,, Nov. 2. Sirius	21	58	53		..	
,, ,, 16. α Persei		..		21	59	30
Means	21	58	49	21	59	28

Mean of S. and N. 21° 59′ 9″ North.

* North end of needle deviating to *East* of astronomical north.
† Obs. spot, British Residency.

Longitude.

I. By Lunar Distances.

						°	′	″
1874.	Oct. 22.	α Aquilæ	1st set.	Moon E. ..	..	96	12	0
,,	,,	α Aquilæ	2nd set.	Moon E. ..	..	95	53	15
,,	,,	Aldebaran	1st set.	Moon W. ..	..	96	9	0
,,	,,	Aldebaran	2nd set.	Moon W. ..	..	96	13	0
,,	Oct. 23.	α Aquilæ	1st set.	Moon E. ..	...	95	53	15
,,	,,	α Aquilæ	2nd set.	Moon E. ..	..	95	48	15
,,	,,	Aldebaran	1st set.	Moon W. ..	..	96	14	30
,,	,,	Aldebaran	2nd set.	Moon W. ..	..	96	8	15

	Moon E.			Moon W.			Daily Means.		
	°	′	″	°	′	″	°	′	″
Oct. 22.	96	2	38	96	11	0	96	6	49
,, 23.	95	50	45	96	11	23	96	1	4

Mean of the Daily Means.

Long. 96° 3′ 56″ East.

II. By Occultations of Stars.

						°	′	″
1874.	Oct. 28.	B. A. C. 1746	..	Reap. ☽ dark limb	..	96	4	32
,,	Nov. 2.	B. A. C. 3579	..	Reap. ☽ ,,	..	96	3	32
,,	,, 16.	ε Capricorni	..	Disap. ☽ ,,	..	96	5	
,,	,, 18.	ψ^1 Aquarii	..	Disap. ☽ ,,	..	96	5	58
,,	,, 18.	ψ^1 Aquarii	..	Reap. ☽ bright limb	..	96	7	36
				Mean	..	96	5	20

Note.—The last observation, being a reappearance at the bright limb, was probably observed too late, thus giving too large a longitude. It was marked as somewhat too late at the time of observation; but Mr. Ellis writes, "I should not recommend the application of any hypothetical correction, but take the result in with the others as of equal value."

Concluded means.

	°	′	″	
By Lunar distances	96	3	56	
By Occultations	96	5	20	
Mean Longitude	96	4	38	E.

Magnetic Variation.

(North end of Needle deviating to East of Astronomical North).

Obs. E. of Meridian.		°	′	Obs. W. of Meridian.		°	′
1874. Nov. 3	.. ..	3	26	Oct. 18	.. ..	2	55
,, 20	.. ..	3	29	,, 19	.. ..	2	48
,, 24	.. ..	4	9	Nov. 3	.. ..	2	53
Mean ..	..	3	41	Mean	..	2	52

Mean of East and West.

3° 17′

VII.—*The North-American Boundary from the Lake of the Woods to the Rocky Mountains.* By Captain S. Anderson, R.E., Chief Astronomer, North-American Boundary Commission.

[*Read*, March 27th, 1876.]

The international boundary-line between the British possessions in North America and the United States, in the central part of the Continent from the Lake of the Woods to the Rocky Mountains, was established by treaty in 1818; but more than half a century elapsed before the necessity arose for surveying and marking the boundary-line on the ground. The Red River Valley was long ago known to be partly in British and partly in United States territory; but in the early stages of the history of the Red River Colony, all its settlers had come from the British side, and no international question arose. The French fur-traders penetrating from Lake Superior to the westward, across a most difficult country of lakes, and swamps, and rocky ridges, had come upon the Red River Valley early in the eighteenth century, and must have realised its great capabilities for settlement. The Hudson's Bay Company, advancing southwards from their headquarters at York Factory on Hudson's Bay, by an equally difficult route, had in the early part of this century also reached the prairie-lands of Red River. The sole object of these rival Companies was the fur-trade, and they had no interest or desire to open up the country for agricultural settlement, or to press for a settlement of the question as to the precise position of the boundary-line. Lord Selkirk, a prominent partner of the Hudson's Bay Company, on his own account, made a treaty with the Indians, purchased some of their land, and in 1812 established on it a colony of Sutherland Highlanders, whom he imported by way of Hudson's Bay, and he left them on the banks of the Red River to endure great hardships, which were aggravated by the constant hostilities of the rival Fur Companies, who, after carrying on a war of extermination with each other for some years, eventually made peace in 1821, and joined in partnership. This union caused the canoe-route to Lake Superior practically to be abandoned for trade in favour of the more northerly route direct to the seaboard. The latter route was available during the months of June and July only, and the ship that annually came from England with supplies took away the furs. The Red River colonists were, therefore, almost cut off from communication with the outside world; while it was impossible for new settlers to come into the country unless they were imported by the Hudson's Bay Company.

In course of time some adventurous traders of the Red River Colony explored southwards, following the course of the Red River to its source, and then crossing the plateau of swamps from which the tributaries of the Mississippi and Red River take their rise, came upon the head-waters of the Minnay Sotor, and thus prepared the way for developing the natural outlet for the commerce of Red River to St. Paul, at the head of the navigation on the Mississippi, and to the then projected terminus of the railroad system of the United States. The railroad was soon extended northwards across the marshy plateau to the head-waters of Red River; and with these facilities, the emigrants coming to Minnesota, and finding the country to the westward a wild, dreary waste unfavourable for settlement, pushed forward down the Red River Valley and established themselves on the river-bank towards the frontier. Subsequently, in 1869, on the creation of the Dominion of Canada, the territory rights of the Hudson's Bay Company were sold to the new Dominion, and after the peaceful settlement of the rebellion in Red River, by the expedition under Sir Garnet Wolseley, the Colony was made a Province of the new Dominion, and a route, available during the summer only, was opened out at enormous cost through British territory, following generally the old canoe-route of the French fur-traders, by which emigrants were encouraged by the Government to settle in the new Province. Thus new settlers came in from the south, and to some extent from the east by the new route, and established themselves in the valley in the neighbourhood of the boundary-line. Near this supposed locality, some twenty years ago, the Hudson's Bay Company had established a trading-post, where the Chippeway Indians, living and hunting near the lakes to the south and east, traded their furs. It was contended by the United States authorities that the Hudson's Bay Company's trading-post was on the American side of the line, and this contested point remained in abeyance till the British and United States Governments agreed to appoint a Joint Commission to settle the matter, and at the same time to complete the demarcation of the boundary-line across the continent, from the point at the north-west corner of the Lake of the Woods, established in 1825 (the westernmost point agreed to between the two Governments under the 7th Article of the Treaty of Ghent), to the summit of the Rocky Mountains, the westernmost point agreed to and established fourteen years ago under the Oregon Treaty of the 15th of June, 1846. The interval of boundary thus remaining undefined comprised about 900 miles of frontier line in the central portion of the Continent, and, in the words of the treaty, this portion of the boundary was to be "A line

drawn from the most north-western point of the Lake of the Woods, along the 49th parallel of north latitude; or, if the said point should not be on the 49th parallel of north latitude, then, that a line drawn from the said point, north or south as the case may be, until the said line shall intersect the said parallel of north latitude, and from the point of such intersection due west, along and with the said parallel, shall be the line of demarcation between the territories of Her Britannic Majesty and those of the United States from the Lake of the Woods to the Rocky Mountains."

In the month of June, 1872, the British Commission was appointed, consisting of Major Cameron, R.A., Commissioner; Captain Anderson, R.E., Chief Astronomer; Captain Featherstonhaugh and Lieutenant Galwey, of the Royal Engineers, Assistant Astronomers; Captain Ward, R.E., Secretary. Lieutenant Rowe, R.E., was subsequently appointed to the Commission as Surveying Officer. Forty-four of the Royal Engineers were specially selected and detailed for duty with the Expedition; and a contingent of surveyors and assistants was appointed by the Dominion of Canada, as well as Dr. Burgess, Surgeon; Mr. Boswell, Veterinary Surgeon; and Mr. G. M. Dawson, Geologist. As soon as the Commission was appointed, the Commissioner and Secretary started at once for Canada, where all ordinary stores and provisions were purchased and forwarded to Red River. In order to ascertain and mark this international boundary with the greatest possible accuracy, it was considered necessary to provide the best class of portable instruments that could be constructed; and with the advice of the Astronomer Royal, under whom the officers were instructed in the special duties required of them, the specification for such instruments as were best adapted for the work was prepared, and the whole order was entrusted to Messrs. Troughton and Simms, who with the greatest skill and energy applied the whole of their staff to the execution of the order. As soon as the equipment and outfit were complete, the officers and detachment of the Royal Engineers left Liverpool on the 22nd of August, 1872, with the special stores and instruments required for the Expedition.

Proceeding viâ Quebec and the Canadian Lakes, the party travelled by permission of the United States authorities from Duluth, on the western shore of Lake Superior, through the State of Minnesota by rail, to the head-waters of Red River; thence, partly by marching and partly by river-transport, reached the frontier at Pembina on the 20th of September. Here the contingent of Canadian officers and *employés* reported for duty, and here the Commission appointed by the United States were also assembled in readiness to commence jointly astronomical

and surveying operations. The season was already well advanced, and the first experience of the Joint Commission in camp on the Red River Prairie was a violent snowstorm, from the north-west, which raged with great violence for three days, and greatly delayed field-operations. The settlers foretold that this was the harbinger of fine autumn weather, which proved to be the case; for during the succeeding month bright and genial weather prevailed with a sultry, hazy, and motionless state of the atmosphere, popularly known throughout Canada as the Indian summer. The position of the boundary-line at Red River was carefully determined independently by astronomical observations taken by the two Commissions, and the results differed by 32 feet, or about one-third of a second of latitude.* This difference was halved, and the position of the boundary-line, as then agreed to confirmed the rough observations that had been previously taken by Captain Palliser and others. The principal point now settled was, that the Hudson's Bay Company's trading-post, the territorial position of which had been disputed, was ascertained to be 250 yards within British territory. In order to take advantage of the open weather that might be expected during the month of October, three astronomical parties were organised by the British Commission, and two of them proceeded to the Lake of the Woods, to commence operations there in concert with the United States Commission; and the third party commenced work at an intermediate point on the boundary between Red River and the Lake of the Woods.

A difficulty presented itself at the outset, as to the exact position of the north-west point of the Lake of the Woods, determined by a former Joint Commission in 1826, being the terminal point of the operations under that Commission, and the initial point of the work of the present Commission. The point was described as being in a swamp, and there being no firm ground in the neighbourhood a pyramid of logs was constructed about a mile south of the spot, at an exact specified distance from the point, which the Commissioners in 1826 had agreed upon as the north-west corner of the Lake of the Woods. All traces of this wooden pyramid had disappeared, but the traditions of its construction were fresh in the memory of the Indians, and guided by the directions of an old man of the Chippewa tribe, some younger members of the tribe indicated a spot, then 18 inches under water in the swamp of the district, from which spot an oaken log was dug up, and the impression

* The method of working and marking the boundary-line is explained in the Appendix.

of a frame in the marsh was noticed, such as would have been made by a pyramid of logs. We were further aided in our investigation by some additional particulars communicated by Mr. Barclay, the British Commissioner of 1826, who, I am happy to say, is still alive; and, though at an advanced age of nearly 90 years, retained wonderful recollection of the circumstances connected with the questions now referred to him. An independent investigation from our own observations and measurements indicated the restored site of the old pyramid only 400 feet distant from the Indians' site. This extraordinary coincidence left no reasonable doubt that we had found the old site, and the Indians' spot was accordingly adopted, and served as the starting-point of the operations of the new Commission. The north-west corner of the Lake of the Woods was re-established and found to occur in a grassy marsh covered by 3 to 4 feet of water. The international boundary-line, starting from the north-west point of the Lake, follows by the terms of the treaty a due-south line for 26 miles to its intersection with the 49th parallel in the open water of the lake.

For the first 16 miles the line cuts off a promontory of the western shore of the Bay, passing over a continuous swamp more or less wooded. In the northerly portion of the line the timber is dense, consisting of birch and tamarac a species of larch, and a great entanglement of fallen timber covers a treacherous swamp, having in bare places a mossy surface which gives way under foot, and underneath is mire and water of varying depth. The cutting and surveying of this line was attended with considerable hardship and difficulty, camp equipage and provisions being transported on men's backs, and for this service, as well as for clearing the line, Indians were employed. The natives of the Lake of the Woods are most independent, and little inclined or physically able for continuous hard work. It became necessary to humour them a little to prevent them abandoning a work which necessitated their being knee-deep in mud all day. The great talker of the party, who is well known throughout the country, began by a great flourish, and very soon disabled himself with his own axe, and eventually settled down as the cook of the party. He was famous for the extraordinary load of miscellaneous baggage that he could collect into one bundle and carry on his back, with the portage straps across his forehead, and jump from log to log, when shifting camp down the cutting. The Indians would only work on the condition that I would take care of their wives and families during their absence. Twelve or fourteen families accordingly arrived and set up their lodges close to the Observatory Camp, and an occasional issue to them of a little flour and bacon

was equally divided among their number, and used with surprising economy. After living almost entirely on moose-meat and a few roots, they have an indescribable craving for flour. During the progress of the work the frost set in on the 8th of November, and travelling through the swamps became easier, though an early fall of snow prevented the swamps from freezing, and the ground continued to be treacherous till the snow along the travelled trail had become well consolidated by constant foot traffic. The due-south line passes almost invisibly from swamp into the open lake, the timber, becoming more and more stunted, merging into willow-bushes and coarse reedy grass. The actual lake-shore was indicated by a sandy beach, on which a few willows struggled for existence; and the surf which had beaten violently on the beach during the prevalence of southerly winds had now become frozen into most fantastic forms, and the floating ice which had been drifted to land was packed and consolidated in a rugged and confused mass, which extended for some distance into the lake, and was merged at last into the regular icy covering which now held the surface of the lake fast. Inland from the beach, a belt of open marsh, fully a mile in width, had become coated with glare ice, 2 feet in thickness, and this ice, which had formed under more peaceful conditions than that in the open lake, was as clear as crystal and strangely beautiful. In striking contrast with the icy desolation of the scene, the Indians, on finding that their work was at an end, ran forward with wild joy, shouting, and enjoying the frequent falls that they met with in rushing thoughtlessly over the ice, till they arrived at the beach-line, where an imposing flagstaff was set up. Just at this time a snowstorm, which had been threatening from the southward, came up with great fury, and, with a temperature below zero, everyone was compelled to cover his face; and the retreat to the sheltered cutting in the woods was almost cut off by the severity of the storm. The true direction in which the men had to travel was only ensured by ranging the men in line, and prolonging the line of travel by looking back on those in rear, who were not allowed to move forward till the foremost ones were placed in line.

The boundary-line continues southerly for 10 miles across the open lake, and intersects the 49th parallel at a spot in the lake where the soundings showed 30 feet of water. Proceeding then due west for 6 miles, the boundary-line intersects the western shore of the lake, at which point a series of observations was taken by the Joint Commission on a little sandy ridge, where a few poplars were found, and a dry spot for the encampment. Close by, a small and independent band of Indians was established, who cultivated some small

patches of land, and owned a few cows, the only remaining evidences of the civilising influence of the early French traders who settled at the Lake of the Woods a century before the conquest, and of whom some faint traditions were told to Sir Alexander McKenzie, on his first visit to the Lake of the Woods, in 1789. The thriving trade which appears to have existed at the Lake of the Woods in fur and fisheries, in the time of the French traders, 200 years ago, has now almost ceased, partly on account of the supply having been reduced, and partly by the diminution by war and smallpox in the number of Indians now residing on the lake-shore. Sir A. McKenzie alludes, in 1789, to the Lake of the Woods as being remarkable in consequence of the Americans having named it as the spot from which a line of boundary between them and British America was to run west until it struck the Mississippi, which, however, he says, never can happen, as proved by Mr. Thompson, Astronomer to the North-West Company, who was sent expressly in 1798 to examine the ground, and reported that the northernmost waters of the Mississippi and one of its tributaries, the Missouri, lie altogether south of a line drawn due west from the north-west corner of the Lake of the Woods. Although this gentleman reported that the north-west corner of the Lake of the Woods was in lat. 49° 35′, and the northernmost bend of the Missouri in 47° 32′ the actual boundary-line was directed by the Commissioners on the 20th of October, 1818, to follow a meridian line *due north or due south* from the north-west corner of the lake to the 49th parallel (although a due-south course was indicated by Mr. Thompson's observations), thence westward along that parallel to the Rocky Mountains; and the same line of latitude (49°) was adopted that the Hudsen's Bay Company had suggested in 1714 to the French Government as the boundary-line between the territories of the British and French traders, who it was expected might come into collision with each other, when pushing forward their trade into the interior of the Continent.

The initial point of the 49th parallel at the Lake of the Woods' western shore was marked on the ground by the Joint Commission of British and United States officers in November, 1872, where after an elaborate series of observations by both Commissions, the independent results when staked out on the ground showed an overlap of territory of 29 feet, and this was most amicably halved, and the intermediate point agreed to as the initial point on land of the boundary-line. The further survey and marking of the line westerly, over 90 miles of country intervening between the Lake of the Woods and the Red River, was accomplished during the winter of 1872–73, by astronomical

parties working from both sides. This region had hitherto been a *terra incognita,* unexplored by white men; and described by the Indians as a vast and treacherous swamp, the freezing of which was retarded by the overlying snow. These swamps were found to be quite impassable for wheeled vehicles or pack-horses during the open season; but by making a *detour* from Red River towards the south for 25 miles, access was obtained to a point on the boundary, 57 miles west of Red River. From this point progress in either an east or west direction was impeded by swamp, and the work was continued with much difficulty till winter set in and the surface of the swamps gradually froze. As the winter advanced and the snow increased in depth, the working parties were supplied with leather clothing and extra buffalo-robes, and the men acquired readily the use of snow-shoes, while the transport of stores and provisions to the most advanced parties was accomplished by dog-trains. Although it was generally supposed that as soon as winter set in, field operations would necessarily be suspended, it was found that the advent of the frost afforded the greatest assistance to the work, for both men and transport animals were spared the excessive fatigue of working through the unfrozen swamps. It was soon ascertained, too, that the winter was the only time in which the country between Red River and the Lake of the Woods could be surveyed, as the swamps were almost continuous, and only intersected at intervals by belts of timber. Although the cold was at times intense, the thermometer often showing 40° below zero, and on one occasion 51° below zero, the working parties were for the most part protected in camp by the woods, and as long as the air was still, no great discomfort was experienced. The least wind, however, caused much suffering and many frost-bites. In using the astronomical instruments, care had to be taken not to touch the metal of the instrument with the bare hand. The observer would occasionally find his eyelid frozen to the eye-piece of the instrument, as experienced by the Russian officers in Siberia. While on the march in a cold wind, the traveller would frequently find his eyelids for the moment frozen together. A severe snowstorm swept over the country on the 7th, 8th, and 9th of January, 1873, causing great loss of life in Minnesota, farmers with their families being caught when driving in sleighs, attempting journeys of a few miles from neighbouring houses. I have a vivid recollection of the storm, in consequence of being out in the open country at the time travelling on snow-shoes, in company with two attendants, and a dog-train carrying blankets and provisions. The dogs were stung so pitilessly in their eyes and ears by the drifting snow, that it was impossible to get them to face it; and they continually

rolled over and buried their heads in the snow. Shelter was at length found in a small island of poplars, and we kept body and soul together by huddling round a fire which was kept going for about eighteen hours, when want of food compelled us to continue our journey. The next day we reached an Indian camp, where we were most kindly received and cared for. The last part of the journey was across the open lake, and the direction of travel could only be kept by running in the teeth of the storm, which happened to be as good as a compass-course. Nothing could have made the dogs travel at the last, except their wonderful sagacity in discovering by scent that there was an Indian camp in front of them, although they had still some miles to go before reaching it. Not the least distressing trouble was having one's face stifled by a muffler, which soon became frozen solid to the face and beard by the moisture of breathing. It thus became necessary, after a few hours' travel, to halt and if possible to get into shelter, and make a fire and thaw out one's face, to prevent suffocation. This storm caught all the working parties of the British Commission at different points where they happened to be at the time, but fortunately caused no loss of life. Two of our men who were out at the time, driving a pair of horses in a sleigh and carrying supplies, were caught in the open prairie, and, being unable to proceed or go back, they lay in the bottom of the sleigh for two days and nights, and were at last rescued without having suffered permanent injury. Their horses, which had been let loose, found their way back to the point from which they had started, and thus gave the alarm which caused the despatch of relief to the sufferers. Although the prevailing weather during the winter months was cloudy and stormy, there were occasional days and nights of clear weather and motionless atmosphere; on these occasions the thermometer would show the greatest degree of cold, and in the woods one audible evidence of the intensity of the cold was occasioned by the freezing of the sap in the trunks and branches of the trees, and the consequent bursting of the bark with a report like pistol-shots. This chorus would continue through the night, and the frequency and violence of the reports would afford a good comparative measure of the cold. On these clear nights the auroras were most brilliant, vapour-like and yet perfectly transparent, so that even the small stars could be distinctly seen through the illuminated mist. One of the grandest that I witnessed formed a canopy in the zenith, and shot out on all sides towards the horizon radial flashes of light ever varying in length and breadth, now advancing, now retreating in a dissolving view, and lighting up the heavens with the glow of early dawn.

The result of the first winter's operations was the completion of the boundary work between the Lake of the Woods and Red River, the work having been continued uninterruptedly in the field from the day of our arrival in September till 3rd April, when the breaking up of the winter and the thawing of the swamps would have rendered operations in those districts impossible. The whole of this section of the work was completed, however, in good time, as well as a topographical survey of the country for 6 miles north of the boundary, by which the position of all important features such as rivers, lakes, and ridges was fixed with reference to the boundary-line. Early in April the whole of the British Commission was collected at Red River and comfortably housed in quarters which had been specially built for us during the winter. The quarters consisted of eighteen wooden buildings, capable of accommodating eleven officers, seventy-eight men, and one hundred and seventy-four horses or oxen. They were built by contract, and completed within two months of the date of commencing them. Although the season had been most trying to the transport-animals, principally on account of our being unable to transport sufficient quantities of hay for their sustenance, the officers and men enjoyed good health, and only a few cases of serious illness occurred.

During the winter of 1872, advantage was taken of a line of telegraph connecting the Red River Settlement with the United States to exchange telegraphic signals for the determination of the difference of longitude between our observatory camp at Red River and the United States observatory at Chicago. Nine hundred miles of wire were placed in continuous circuit, and instantaneous comparisons of the local time at the two ends were made on five successive nights, simultaneous with observations of the stars for determination of local time at each place. In midwinter the insulation of the wires was perfect, and this long circuit was worked without difficulty; though great trouble and annoyance was occasioned by the clerks at the numerous intermediate stations fighting on the wire, that is, trying to send simultaneous messages when only one message at a time was practicable, and they occasionally sent me abusive messages for occupying the wire with what appeared to them nonsense. The observations were fortunately completed before the great snow-storm, already alluded to, which swept down hundreds of miles of posts and wires, and destroyed telegraphic communication for two months as effectually as if it had been done by the scouts of an invading army. The correct position of the crossing of the boundary-line at Red River was now determined in absolute latitude and longitude, the former by duplicated observations of the Joint

Commission giving independent results differing by 32 feet only, as already stated; and the longitude determined with a probable error of less than 100 yards with reference to the meridian of Chicago, which had previously been connected with Greenwich. This result will be of the greatest possible importance in the future, as it will be the starting-point of all surveys in the central portion of the continent where the accurate geographical position of important points had hitherto been so little known, that the old official maps showing the north-west point of the Lake of the Woods had an error of 4½ miles in longitude. This might have been expected from the means at the disposal of the surveyors when the survey was made fifty years ago.

On the breaking up of the winter, there was an interval of about six weeks in which no field operations could be undertaken, in consequence of the whole country being flooded by the rapid melting of the snow; and vegetation made little or no progress till the middle of May, by which time night-frosts became less frequent. At that season one warm day and one warm night following were sufficient to make the whole surface of the prairie green with new vegetation springing into life, and at the same time mosquitoes began to swarm in myriads, and continued to increase in numbers and ferocity as the spring advanced. During the six weeks' cessation from active work much preparation was needed for the operations of the ensuing season, and in order to make the most of the short summer season of about five months, arrangements were made to distribute the working parties simultaneously over about 90 miles of boundary, and attack the work at several points at once. To do this advantageously, it became of the utmost importance that the country should be well explored and reconnoitred, in order that no delay should occur to the several parties proceeding at once to take up the work at convenient points. This work was accomplished by a reconnaissance party, consisting of thirty scouts selected from the Red River half-breeds. They were mounted on their own ponies, and armed with Spencer carbines. The scouts were lightly equipped, and were accompanied by an officer by whom the necessary astronomical observations were made for latitude and longitude, and by whom a reconnaissance map of the country was prepared showing all important features. The best route for travel was also marked out, the most suitable spots noted for halts and encampment, and depôt sites selected for storing and distributing supplies. The approximate position of the boundary-line at points where more accurate observations were to be taken was also marked, so that the astronomical parties were able at once to proceed to their destination and set up

their fixed observatory instruments within one hundred yards of the boundary-line, and subsequently measure north or south to the exact position of the 49th parallel when the final result of the observations and calculations was known. The work of the reconnaissance party was thus important, as it greatly facilitated and expedited the subsequent operations.

Of the country to the westward of Red River little or nothing was known. The fine alluvial prairie of the Red River Valley was found to extend for 35 miles to the westward, and then to be bounded by the first Prairie Steppe called Pembina Mountain, an ancient shore-line which was conspicuous for many miles before reaching it from the eastward, as an unbroken blue ridge with elevated table-land beyond. This proved to be wooded with a small though dense growth of poplar, and the boundary-line passing through 8 miles of rough ground, came upon the gorge of the Pembina River, which flows in a deep ravine 350 feet below the table-land, and 3 miles in width from summit to summit. In this district during the month of June 1873 the locusts were being hatched in swarms, and in sunny situations, especially on the logs of fallen trees, they were most abundant. These insects were only in the crawling stage at that time, but later on they took flight and completely devastated the crops in the Red River Valley. In consequence of the ground being very much broken at the boundary-line in Pembina Mountain, the line of travel for heavy waggons was diverted 8 miles to the north, where the river was found to be fordable when the waters were at their ordinary summer-level. On passing this ravine an ascent is made to the upper plateau and to the commencement of the great plains which extend in one vast expanse, more or less broken, to the base of the Rocky Mountains, 700 miles distant. The great plains resemble a land sea, sometimes perfectly level, at other times abounding in hillocks and undulating ground, and occasional prominences rising 30 or 40 feet above the general level of the plain are met with, from which a panoramic view can be obtained to the horizon 10 or 12 miles distant. From these elevations the vastness and solitude of the plains can be seen and realised. A clayey soil, with some admixture of sand, supports a stunted growth of prairie-grass growing in bunches, and in every direction across the plain buffalo-tracks or old pathways are distinctly marked, and in many places the bleached skulls and bones of the buffalo are scattered about, in evidence of the vast numbers that must formerly have grazed over the ground, and of the wholesale slaughter that has practically exterminated them in this section of country. The only signs of life that attract the traveller's attention are the innu-

merable badger-holes by which the plain is honeycombed, and the soil is frequently found to be newly disturbed by these indefatigable animals, as if they were attempting to bar the progress of the rider by countless and treacherous pitfalls. In proceeding to the westward on the boundary-line, the first section of the Great Plains is found to be 70 miles in width; over this area there is, in common with the whole tract of plain in the central part of the continent, no rainfall during the summer months except from passing thunderstorms, and the growth of the scant prairie-grass during the months of May and June is altogether dependent on the moisture derived from the melting of the winter snow; the snow-water collecting in hollows forms pools which supply moisture for some weeks during the early summer to the adjoining soil. But for this circumstance the excessive heat of the sun during the month of June, and the want of rain would convert the prairie surface into a sterile waste. Patches of good grazing-ground can be found in all directions; but, in consequence of the want of rain and the exposure of this area of plain to the cutting winds from the north-west, and the frequency of night-frosts during the summer over the country here elevated 2000 feet above the level of the sea, the soil is not suited for the growth of cereals, but there will always be good pasture, the value of which has been proved by the presence of the buffalo in former times. The short grass that comes to maturity in the moist hollows and undulations of the plain is most nutritious, and grazing animals would fatten on it rapidly, were it not for the incessant mosquito plague which drives even the domesticated animals almost wild, and keeps the strong ones poor, while the weaker ones fall away and die if they are put to any kind of work. During the heat of the day the mosquitoes become torpid, and there is a lull for a few hours, when the horses and oxen can graze and rest in peace.

After crossing the 70 miles of plain levelled by the great drift in former ages, which has left great boulders of granite and limestone stranded in all directions, a curious elevated and thickly wooded district occurs, extending for 34 miles along the boundary, and this feature, known as Turtle Mountain, from its shape as seen in the distance against the sky-line resembling in appearance the head and body of a turtle, commencing in United States territory, protrudes for 8 miles across the line into British territory, where the principal portion of the wood occurs in consequence of having a northern exposure. The wood is chiefly poplar, but oak and white birch with ash-leaved maple are also found, and some of the poplar-trees in sheltered places are 2 feet in diameter. The interior of the mountain abounds in lakes and swamps, so large and numerous that the Indians were of

opinion that we should fail in our attempt to survey and mark the boundary in a continuous line across the mountain. The difficulties pointed out by the Indians were not exaggerated; for it turned out that the boundary, in its course of 35 miles in Turtle Mountain, crossed sixty-five pieces of water, of which twenty-five are true lakes with gravelly shores, necessitating a survey by triangulation instead of the ordinary method by direct chaining. The marshes supported a permanent crop of wild vetches on which the horses fattened rapidly, and the water, though stagnant, was generally good. A party of British surveyors and axemen was occupied during the whole summer season of 1873 in tracing the boundary through the mountain for 24 miles from the eastward, when a junction was effected with a working party of the United States who had entered the mountain from the west, and marked the boundary-line eastward for 10 miles, when further progress from that side was barred at the time by a large lake more than a mile across, and extending for some miles into British and United States territory. The vivid greenness of the woods and the solitude of these well-sheltered lakes made many parts of the mountain singularly beautiful, and the melancholy cries of the loon, or northern diver, alone disturbed the peacefulness of the scene. Many red deer and bears are found in the mountain, and are hunted by a few families of the Sioux Indians, who, though belonging properly to the United States side, have taken refuge on the British side since 1861, when they declared war with the United States by massacring nearly all the American settlers in the upper portion of the Red River Valley. These Indians now carry on a good trade in furs, which are exchanged at the Fort Garry Settlement for ammunition, guns, or articles of clothing. This district of Turtle Mountain will be invaluable to settlers in the future, furnishing, as it does, an ample supply of wood for building and fuel purposes, and wintering ground for stock, while the adjacent plains will serve as grazing ground during the summer. During the operations of the Boundary Commission a depôt was kept up here for storing supplies, and a large store-house constructed of poplar logs, in which the care-takers lived during the winter months. Communication with the headquarters at Red River was somewhat precarious at that season except by dog-trains, but the more northerly settlements on Red River are of easier access in consequence of intervening strips of timber, where travelling in winter would be less dangerous than crossing the 70 miles of open prairie immediately to the eastward. The effect of the wooded area of Turtle Mountain was very marked in attracting rainfall from the clouds, while the surrounding plain suffered from continued drought.

The thunderstorms, especially, seemed to discharge themselves here with terrible violence, and the lightning appeared in balls of fire flying into the ground, and in such quick succession of flashes that at night the air seemed to be continuously illuminated. On the hottest days there would be occasional hailstorms, with hail-stones as large as the eggs of a bantam fowl, causing at once a consternation and stampede among the horses. When encamped in the open plain, the hurricane that accompanies the thunderstorm frequently lays low every tent in the camp, while the plain for the time is converted into a vast lake. In the course of half-an-hour every symptom of the storm will have disappeared, and the mosquitoes will have renewed their attacks fiercer than before.

The great plains continue beyond Turtle Mountain for 138 miles, at an average elevation of 2000 feet above the sea; the only breaks that occur in the monotony of the scene are occasioned by the Souris River, which, in its meandering across the plain, has cut out a valley of varying width from 1 to 2 miles, and a depth of 150 feet below the plain. In the shelter thus afforded some timber grows on the bank of the stream, and there is an abundance of good pasture at all seasons. The operations of the Joint Commission in this portion of the work were greatly assisted by this valley, which crossed and recrossed the boundary several times, and always afforded good camping-ground. At one point in the Souris Valley, near the boundary-line, occur some remarkable rocks, known as Les Roches Percées, which have long been objects of superstition and veneration by the Indians. A soft sandstone, which underlies a capping of harder stone, has weathered into most curious figures, some castellated, and the whole series presents the appearance of ruined dwellings, which the Indans believe them to be. The soft rock bears in many places rude Indian carvings with birds and other animals.

No difficulty was experienced in tracing the boundary-line continuously across the Great Plains, but the constant mirage greatly delayed surveying operations during the day; for over the whole prairie surface the air was in continual agitation, and in looking through the telescope at a distant flagstaff it was seen to dance with persistent contortions, and no observations to terrestrial objects could be made from point to point with accuracy, except in the early morning or late in the evening. Unhappily, when the flagstaves were at rest the mosquitoes were most active, and altogether the observers had not an easy task. The general level of the plain is not disturbed for 140 miles west of Turtle Mountain, but a warning of some change in the character of the country was given by a low-lying ridge

bounding the distant horizon to the westward, forming a coast-line to the land-sea beneath it; and this feature, which becomes less and less defined as one approaches it, is the Great Coteau of the Missouri, and is one of the most important features of the western plains. It is the second prairie steppe of the North-American Continent, and crosses the country from north-west to south-east. This coteau or prairie steppe leads to a very remarkable plateau, of an average elevation of 2250 feet above the sea, which is broken up in a succession of ridges, valleys, and basins, presenting in section a very broken and irregular profile. The boundary-line for 50 miles crosses the Great Coteau district, and over the whole of this distance there is no well-defined ridge or water-course, but the same confused monotony of ridges and hollows. Those are succeeded, as one travels westerly, by a more undulating country, in which large alkaline lakes occur; and as the waters evaporate during the summer, a white saline deposit remains on the shore-line, which contrasts strikingly with the Salicornia, a crimson plant which fringes the salt lakes, and at once marks their brackish character. The chain of salt-lakes extends in almost an east and west direction for 15 miles, and over the whole of this district, including the Great Coteau, the waters have no outlet to the ocean. We are thus in the central water-parting of the continent; for the waters we have left behind us find their way by the Red River into the Hudson's Bay, while the ravines that are now opening out to view towards the west drain southwards to the Missouri, and find their way to the Gulf of Mexico. A great change is now observable in the topographical features; owing to the nature of the soil, which is of clay and very friable, denudation proceeds very rapidly during the short period that the soil is saturated with the snow-water, and the valleys are often scarped by deep and almost vertical sides, which in many places become baked by the heat of the sun and resemble retaining walls. The peaks and ridges of the clay-hills are weathered into most varied forms, some turret-shaped, others conical, and in many instances the peaks and ridges are capped by a natural brick material, burnt to a red colour by the combustion of the beds of lignite or tertiary coal which are scattered through this clay formation. The soil is unable to support vegetation, and this rugged and desolate country, which somewhat resembles the wilderness of Judæa, is called by the half-breed hunters "Les mauvaises Terres." Though the principal portion of this semi-desert occurs on the United States side of the boundary, a wedged-shaped area protrudes into British territory, measuring at its base on the boundary 7° of longitude, or about 320 miles, and tapering off north-

wards to a point near the Great Elbow of the Saskatchewan 125 north of the Line. In the central portion of this triangular district the plateau has on its north side a few sheltered ravines containing small groves of poplar, and in the country falling towards the north, being less broken, some good pasture is found. This locality, which is of very limited area, probably 36 square miles in all, was for a few years the winter residence of about 80 families of half-breed hunters, who, though originally belonging to the Red River Settlement, 25 days' journey to eastward, were forced by the migration of the buffalo to travel so far westerly in pursuit, that they were unable to return to Red River, and have consequently abandoned their old home, and have established their winter-quarters nearer the buffalo-country. This site, known as Woody Mountain, had been visited by many of the old half-breeds of Red River, and though it was suspected to be in British territory, it does not appear to have been visited by any travellers competent to determine its geographical position. It was consequently a matter of the greatest value and importance that the reconnaissance party of the British Commission during the summer season of 1873 were able to push so far to the westward as to discover the position of this oasis in the middle of the semi-desert, and but for the happy accident of meeting a party of Sioux Indians who said that they had just come from a hunters' encampment a long day's journey to the northward, this site would not have been discovered that season, for it lay 25 miles north of the boundary-line, concealed among the ravines on the reverse or north side of the plateau, of which the southern escarpment only had been explored, further progress northward having been arrested at the time by the equinoctial snow-storms, which left 18 inches of snow on the high ground, and completely filled up the valleys by drifts. The back track of the Sioux Indians was followed through the snow for 25 miles northward across the plateau, where the reflected glare of the snow was so great as to cause all the reconnaisance party to be more or less affected with snow-blindness. The rude and desolate huts of the half-breed hunters were found in some sheltered ravines, and, with one or two exceptions, all the families were absent in the direction of the Rocky Mountains for the autumn buffalo-hunt. A few hours' detention at this place, and the good fortune of a bright, sunny morning, sufficed to determine the latitude and longitude of this favourable spot, which was found to be 22 miles north of the boundary and 416 miles due west of the Red River. It was found from its position and natural advantages of wood, water, and good pasture, to be admirably suited for a depôt site from which the Boundary Commission could complete the marking of the

boundary-line to the Rocky Mountains in another season. The autumn being well advanced—for it was now the 8th of October—by previous agreement surveying operations were suspended for the year, and a general retreat towards Red River was ordered; 408 miles of boundary having been continuously surveyed and marked by the Joint Commission during the four and a half months of the summer season, and at the same time a map was made by the British Commission of a belt of country throughout, for an average distance of 6 miles north of the boundary.

The latter part of the autumn season had not passed without one or two incidents worthy of record. The heat of the sun and the excessive drought during the summer had completely parched the prairie-grass, and the soil was fissured in all directions. Although the greatest vigilance was practised, the occurrence of prairie-fires seemed inevitable, and towards the end of August a pillar of smoke visible to the north, a great distance off, gave warning that before many days were past, the whole of the Great Plains would be swept by fire. The course of the fire was most capricious, and often turned by a ravine, or by a slight change in the wind, into a new course. The onward progress of the fire was noticed for many days by the gradually-increasing temperature of the air, and soon by the smell of the burning grass. The various parties of the Boundary Commission being scattered over 400 miles of longitude at the same time, experienced very varied fortune in their encounter with the fire. A surveying party working in one of the ravines 5 or 6 miles from their camp, found that the fire had swept round behind them and threatened their camp with destruction. They had just time to reach their camp, and to tear down their tents, and to plunge everything into an adjoining pool to save their camp-equipage, and much was partially destroyed. A commissariat waggon-train, drawn by oxen, was also overtaken by the fire, and though a burnt patch of ground was prepared, and the oxen released from the waggons and driven to it, the unfortunate animals were too much alarmed to remain quiet, but rushed about wildly in the flames and were badly singed about the legs. One of the men had the hair on his face burnt, and in the rush of wind accompanying the passage of the fire, his hat went away, adding fuel to the flames. At one of the astronomical camps one of the officers, seeing the onward progress of the fire, employed all the men in the camp to meet the fire and save as much grass as possible by burning a strip; this was so far successful that about 400 acres of grass were saved, which were of incalculable value to the transport-animals on the final retreat; but the fire that had been started with this object at last got beyond control, and swept back

upon their own camp and nearly destroyed it. On one occasion one of the labourers thoughtlessly struck a match on his boot in a patch of long grass, and in an instant the fire flew, and though the camp was saved, the effect of that fire was afterwards ascertained to have destroyed the grass for 150 miles of longitude, and then to have turned southwards, when it is probable its progress in that direction was not arrested till it reached the Missouri River. The result of all these prairie-fires, which raged in different localities between the middle of August and middle of September, was that the general appearance of the country was now changed from the universal yellow tint to a dismal black, and the whole surface of the plains was as bare of herbage as the sand on the sea-shore. The homeward march was consequently rendered doubly anxious by the want of fodder for the horses and oxen; but by diligent search patches of grass in marshy places were found, where the fire could not reach, and to such places mowers would be sent with light waggons to cut as much grass as they could find during the day's march, and bring it to the main body later on in the day, at the camping-ground.

From the experience of the previous year at Red River, the period of the autumnal equinox was looked to with some anxiety; and the equinoctial snow-storm of the autumn of 1873 was unusually severe. The operations of the Commission had at that time advanced so far westward into the plain as to be beyond the reach of fuel of any kind, and the line of travel as well as the camping-grounds were necessarily in a shelterless country. The great snow-storm commenced suddenly with little or no warning, on the 23rd of September; and the various working parties, as well as the commissariat trains that happened to be on the march at the time, made such shelter for themselves as circumstances would permit. By placing the waggons in a horse-shoe form, and stretching canvas-sheets on the interior side, shelter was afforded to the horses from the driving sleet, which now set in with great violence from the north-west. The light canvas-tents formed but a poor protection for the men, and, in the absence of fuel, there was no help for it but to huddle together and get under their blankets. The storm continued, with scarcely any intermediate lulls, for seven days, during which period it was impossible to get the horses to graze, for as soon as they were turned out they would all come back again to the shelter of the waggons. During these seven days of forced inactivity, the horses lost flesh sadly, and many were incapacitated from work for the remainder of the season. Although this storm, as we well knew, was the forerunner of some weeks of fine autumn

weather, it bequeathed to us a substantial legacy of 8 inches of snow, which caused great difficulty and discomfort in executing the concluding operations of the season; and though the snow in course of time disappeared on the lower levels, the higher ground was still covered with snow a fortnight after the storm. I heard afterwards that the half-breed hunters, who were in temporary camps hunting buffalo to the west of us, were also caught by the storm, and some of them were unable to find their way back to the camp, and were afterwards found frozen under the cover of some buffalo-hides, which they had stripped from the animals they had just killed. The melting snow fortunately filled up the low lying pools, and supplied water in places where it was greatly needed. The whole of the British Commission made good their retreat to Red River in independent detachments, as originally organised for the work of the season, the rearmost party arriving on the 31st of October; and three days previously the Red River was completely frozen over, having remained open for navigation for about six months. The sudden closing of the river, a fortnight earlier than usual, caused great inconvenience, and both steamers and small boats found themselves suddenly frozen in and compelled to pass the winter at places where they had made no preparation for winter-quarters, and where they were in great danger of being crushed by ice on the breaking-up of the winter. The horses and oxen of the Commission were housed in wintering stables, which were specially built half sunk in the ground. During the winter of 1873–4, the permanent staff of the Commission were fully occupied in revising astronomical calculations and preparing fair plans of the country surveyed during the previous summer and winter seasons, and special arrangements were made for the field operations of the ensuing season.

The operations of 1874 were arranged to be carried out in a similar manner to those of 1873; supply depôts were to be established at intervals of about 100 miles on the main line of communications, by which the working parties would procure supplies. As the work would, however, commence at a point 430 miles distant from Red River, and from there would gradually lengthen out in a direction generally due west, it was necessary to establish a new base from which the Commission would actually commence work, and in which they could fall back to winter, in case the work could not be completed to the Rocky Mountains during the summer of 1874. Woody Mountain was selected as the new base, and a contract was made with an enterprising American merchant of the Upper Missouri country, to deliver at Woody Mountain enough forage to meet the wants of the Commission for the first half of the working

season, while the same gentleman contracted to deliver at an intermediate point on the boundary, and nearer the Rocky Mountains, a further supply of forage to complete the requirements for the remainder of the season. It need only be added here that this contractor, with no previous knowledge of the country, except that it was occupied by Indians unfriendly to United States citizens, faithfully performed his contract with extraordinary risk to himself and his waggon-trains. In consequence of this element of uncertainty, the principal supplies of food and forage were freighted by our own Commission trains, direct from Red River; and for this purpose 125 waggons were employed by the British Commission, of which 100 were drawn by pairs of oxen, and 25 by pairs of horses. As it would have been inconvenient to have moved this large waggon-train in one body, an advanced party of 20 waggons, drawn by oxen, was despatched westward from Red River early in May, with orders to advance by easy stages in company with a road-making party, under Lieutenant Rowe, for the purpose of improving the road and building bridges over rivers and marshy plains. At the same time a reconnaissance party, under Mr. Crompton, with the light wooden carts of the country and native ponies, was directed to push forward to Woody Mountain, to commence the construction of depôt buildings there, and to proceed 100 miles further to the westward to explore a site for a more advanced depôt. These arrangements were carried out so efficiently that the main body of the Commission, starting a fortnight later with the bulk of the *personnel* and commissariat supplies, comprising 160 officers and men, and 70 waggons, advanced for the first 200 miles without a check to the first crossing of the Souris River. This river was not fordable, being in flood at the time, and flowing in a strong stream 55 yards wide. Three days were occupied in bridging the river, which was done by sinking at suitable intervals loaded cribs which supported the roadway. The materials for the bridge were collected at intervals, several miles distant, from the scant growth of timber on the river-bank. On the fourth day the whole train of heavy waggons crossed the temporary bridge without a casualty. Shortly afterwards a gloom was thrown over the whole of the Commission by the temporary disablement of Lieutenant Rowe, from fracture of the skull occasioned by a violent fall from his horse. As the precarious condition of this officer did not admit of his being moved, a hospital-camp was established on the spot, and, under Providence, Lieutenant Rowe's life was saved by the skill and unremitting devotion of Dr. Burgess, the Surgeon of the Expedition, and the companionship of Captain Ward, R.E., the Secretary, during six weeks of incessant watch-

ing and anxiety. The astronomical and surveying parties, under their respective officers, were detached from the main body at the foot of the Great Coteau, and proceeded by the boundary-line track to their several destinations, where they were to commence operations, while the heavy commissariat-train proceeded westward by an easier though more circuitous road to Woody Mountain. We arrived at this site on the 22nd of June, the oxen with loaded waggons having accomplished the journey of 450 miles in 32 days, inclusive of six days' halts or detention. The reconnaissance party, under Mr. Crompton, had arrived at the same place three weeks previously; and had already returned from a successful exploration of the country, for 100 miles to the westward; while all cause for anxiety respecting the delivery of the first instalment of forage from the distant settlements of South-West Montana was removed by the punctual arrival at Woody Mountain of 60 tons of oats on the 1st of June.

The method of freighting adopted by the Americans in the Western plains may be considered worthy of passing notice. Each vehicle is mounted on four broad-rimmed wheels of unusally broad gauge, and the body has nearly vertical sides, the whole height being 12 or 14 feet. Into this huge car 4 tons of grain are packed in bags; two of these waggons are linked closely together as in a railway-train, and to the foremost van are yoked nine pairs of oxen, the pair at the pole and the leading pair being thoroughly broken animals, while the intermediate pairs of oxen are more or less wild and untaught. One teamster manages this formidable charge. The waggon-train is made up of pairs of vans in the same fashion, and the whole makes its way slowly across the unbroken plain at the rate of about 1½ mile per hour. The drivers do not follow immediately behind each other, in order to avoid the ruts, which are cut to a depth of 6 or 8 inches in the dry ground, and the waggons frequently sink to the axletrees in soft soil. On coming to marshy places or to steep hills, the waggons are detached and taken one at a time over the bad places; an extra string of nine pairs of oxen, making eighteen pairs in all, being frequently employed to extricate a single waggon from a swamp-hole, or to take it up a steep hill. In this way oxen are found to work to the greatest advantage, as in a long string they pull at different times, and thus in turn obtain relief from the fatigue of continuous draught. The oxen are specially suited for marshy ground, as they do not sink in it, nor strain themselves by plunging when in difficulties, as a horse would do. The oxen are not shod in the first instance, as they travel better barefooted across the plains; but as soon as an animal becomes sorefooted, he is shod on one or more feet as may be found necessary. It requires special skill and

management to shoe an ox, as the animal has a great objection to having his feet touched. In the operation of shoeing, the ox has to be thrown on his back and firmly secured, and each foot requires two distinct shoes, in consequence of the split hoof. By carefully watching the oxen as they work, and by a liberal provision of spare animals in the first instance, who travel along with the train and give no trouble, the weak or tender-footed animals can always be relieved in good time, and, after a few days' quiet travel out of harness, they are generally fit for work again.

On the arrival of the heavy commissariat-trains of the British Commission at Woody Mountain on 22nd June, arrangements were made for pressing forward vigorously the surveying operations on the boundary, and every effort was made to keep the supplies of provisions if possible ahead of the work, while the reconnaissance operations were kept still further in advance. To avoid the broken and inhospitable country of the Bad Lands, through which the boundary parties had necessarily to work at the commencement of the season, the main route for transporting supplies was far to the north, and no passage could be found across the formidable gorge of White Mud River, nearer to the boundary than 16 miles to the north. Even to this point the astronomical and surveying parties had great difficulty in making their way in consequence of the intervening country being a rugged mass of ravines, ridges, and conical hills. On the plateau of White Mud River early in July swarms of locusts were found. The air was also full of them, and in looking towards the sun the air had the appearance of being filled with snow-flakes. The locusts in due time advanced into the Red River Valley, and destroyed the greater part of the crops as they had done during the previous summer. At this time the services of the half-breed scouts were found invaluable in their capacity of express riders, conveying orders between the different camps of the British parties scattered over 60 miles of boundary. A selected number of sound and powerful oxen advanced steadily to the westward with supplies at the rate of 16 miles per diem, while the immediate wants of the working parties were met in the first instance by a commissariat horse-train which was able to advance more speedily, so that supplies were ready for issue on 7th July on the boundary-line, at a newly established depôt 150 miles beyond Woody Mountain, a fortnight after the first arrival of the expedition at the latter place.

The boundary-line, at a point 500 miles from Red River, having now emerged from the broken country, entered upon an arid plain of sand with some light soil intermixed, scarcely able to nourish a light sod, but a cactus-plant flourished in

great abundance. The buffalo were met with here in great herds, and on one occasion were noticed to be coming up from the south at a rapid pace. The waggon-train, which was on the march at the time and extended in single file over a long line, was hurriedly closed up and halted in preparation for the buffalo onslaught. The terrified animals came rushing on at a furious gallop, with their heads low down and enveloped in a cloud of dust, so that they could see nothing in front of them. The scouts in attendance on the waggon-train fearlessly rode at them, and fired at them with their breech-loading carbines, which had the effect of making the herd open out so that they passed on both sides of the waggon-train. It was then discovered that the herd were being pursued by Sioux Indians, who suddenly appeared and vanished again in the cloud of dust. The wounded animals dropped out of the herd, and became an easy prey to the rifles of the waggon teamsters. For about 100 miles of longitude, the plain was swarming with countless herds of buffalo, and, like an invasion of locusts, they swept everything before them. The scant vegetation was everywhere nibbled close, so that our own horses and oxen fared very badly. The few pools of water available for camping purposes were generally taken possession of by buffalo, and frequently one had the mortification of seeing a herd of buffalo charge into the only pond of water available for camp purposes, so that the water was spoiled for drinking, and even the horses could not be induced to drink it. However, some fresh-water lakes surrounded by an abundance of fine hay-grass were found on the boundary-line in the heart of the buffalo country; and on this remote spot were encamped, during the months of June and July, 150 families of half-caste hunters, cut off entirely from the civilised world, and depending for food on buffalo-meat. They were assembled and organised as one community for mutual protection. Their home-made carts were arranged in a circular form, and packed closely together, forming an enclosure 150 yards in diameter, into which their ponies were driven at night and guarded. Around and outside the circle of carts, the skin-covered tents or wigwams were pitched, where each family had its home, and lived separately. Great order and regularity prevailed in the camp, principally due to the influence of a French priest who lived with them, and seemed to be their chief adviser in temporal as well as spiritual matters. Business was transacted by a council who met daily, and decided where they should hunt. On the hunting-days, the women and children driving the pony-carts would follow in rear of the hunters to carry home the meat. Each hunter would probably kill six or eight animals early in the day, and for the remainder of the day his whole

family would be employed cutting off the meat, the best pieces only being taken, the hide and forequarters being left. For many miles the air was soon poisoned, and in every direction could be seen evidence of the reckless slaughter and wanton waste of the hunters. The half-breeds are in constant collision with the Indians, and no quarter is either given or received.

The 50 miles of arid cactus-plain, already alluded to, is bounded on the west by the remarkable gorge of the Milk River, and for 12 miles the boundary-line is engulfed in the main valley and its tributary ravines. This gorge was explored for 40 miles of its course before a crossing-place for waggons could be found, and the only favourable passage proved to be 10 miles south of the line. The country on both sides of the main valley is much broken with tributary ravines and gorges, the banks of which are in most places nearly perpendicular, and rising 300 feet above the river-level. The river itself is very insignificant, and at the fording-place, where the current was running rapidly on the 10th July, the stream had completely disappeared in the sand a fortnight later, and the water was found in pools only, and in most places brackish. In the arid plateau, stretching for 25 miles westward beyond the Milk River, some sage-bushes occur; both rattlesnakes and the large prairie-fowl, or wild turkeys, were found in this district, which is of similar character to the great plain of the Columbia, west of the Rocky Mountains.

We were now approaching the three Buttes or Sweet Grass Hills, the most prominent and important feature of the western plains. The first view of the Buttes was obtained when standing on the high ground overlooking the sandy cactus-plain. From this point of view the nearest Butte is 100 miles distant to the west, and its conical peaks, which stand out mistily against the sky-line when viewed in the early morning, are quite lost in the haze of the afternoon sun. Thus, to a traveller approaching the three Buttes from the eastward, they seem to recede during the day's travel, and though invisible at sundown, at sunrise the next morning they appear to have advanced close to the camp. At the foot of these hills their influence is very noticeable in the growth of more luxuriant herbage on the soil, by reason of the rainfall which occurred daily among the hills, while no rain fell on the surrounding plain. On passing around the northern slope of the eastern butte, the summit of which is 6 miles south of the Line, the plain was much breken and intersected by valleys and ridges, and for 25 miles the reconnaissance party had some difficulty in finding a practicable route to the westward for the heavy waggon-train. After crossing much undulating ground, an excellent site for a principal depôt was found a little north of the boundary-line, on a small stream running southwards from the wes-

tern butte, and the indomitable oxen arrived here with full supplies, in charge of the commissary, Mr. Herchmer, and his indefatigable waggon-master, Mr. O'Donnell, on the 24th July, on which date the second astronomical party under Lieutenant Galway, marching independently, arrived at the same point to commence operations. The British Commission had thus, in seventeen days, made a further stride of 108 miles to the westward. A few days' detention at this depôt-site afforded opportunities for an examination being made of the three Buttes, and Mr. Dawson, the geologist, reported that they are of igneous origin. They form a little mountain region of themselves, the highest peaks being 6800 feet above the sea, and from the heart of the Buttes precipitous valleys open out, well wooded, and in which there is an abundance of springs, which issue for some distance out on the plain and are there rapidly absorbed. In the recesses of the mountain region, horned sheep were found, and the buffalo in vast numbers are attracted to the luxuriant pasture-grounds that abound on the hill-sides. The deadly combats that have occurred between the Blackfoot and Crow Indians, when meeting in this region in pursuit of the buffalo, have in some degree made it a neutral ground, but a recent battle must have been fought, as the bodies of twenty Crow Indians were found on the plain a few miles from the depôt camp. They were all scalped, and in consequence of the intense dryness of the atmosphere, the bodies were completely sun-dried and well preserved. From the hill-sides of the western butte, the Rocky Mountains, 115 miles distant, are in full view, and the mountain-peaks, in a rugged and snowy outline, stand out in full relief against the western sky-line. Anyone ascending the northern slopes of the western butte comes to the boundary-line at the same spot where the first view is obtained of the Rocky Mountain peaks. The intermediate country consists of undulating and gravelly plain, over which one passes imperceptibly from the basin of the Missouri to the Saskatchewan Waters at St. Mary's River. This river rises in the mountains, and flows northward boisterously in a channel full of boulders and shingle. No sight could be more welcome than the clear and sparkling waters from the mountains, after the stagnant pools and muddy rivers of the Great Plains. Many granite boulders were found on the plateau near St. Mary's River. The bed rock, from which these blocks must have travelled, is 700 miles distant. Some bituminous coal was found exposed in the river-banks. On crossing St. Mary's River the boundary-line enters the fertile belt which extends for 25 miles to the base of the Rocky Mountains. A great change for the better is now observable in the soil, which is very undulating and even hilly before arriving at the actual base of the moun-

tains. A thick vegetable soil supports a luxuriant growth of grass, and groves of poplar are found, the growth of which is checked by the fires which occasionally sweep through the country. Although we are now 4000 feet above the sea at the foot of the mountains, the same plants that were noticeable in the Red River Valley reappear here, having been wanting in the intermediate country, while birch and coniferous trees are found in sheltered localities. The evidence points to the conclusion that the climate is much milder here than in the Red River Valley, and the actual experience of the settlers in Montana at the foot of the mountains, 300 miles further south, is that this fertile strip of country is well suited for the growth of cereals, and cattle can winter out. The mountain-streams abound in fish, and it was no uncommon thing for a man, during an afternoon's fishing with a rod and line and grasshopper-bait, to bring home a sackful of 3 lb. trout by the evening. The boundary-line passes through 20 miles of out-lying mountainous country, which can be avoided by a detour of a few miles to the north, to the foot of the great mountain barrier. The mountain ranges rise at once into precipitous peaks 4500 feet above the plain, and the mountain masses retreat north-westerly in successive ranges. The horizontal strata of the plains are suddenly broken by the crumpled rocks of the mountains, elevated by a great convulsion of nature. The limestone beds on the peaks and mountain ridges, are weathered into the most bold and rugged outline, while underneath are the sandstone beds of variegated colours.

In a cleft lying due south, Waterton or Chief Mountain Lake is enclosed, and by rafting on this lake access is obtained to the boundary-line in the heart of the mountains. The lake opens out northwards to the plain, and at its extremity is the western limit to which wheeled vehicles can be taken. A remarkable collection of mounds on the plains at the outlet of the lake was found by Mr. Dawson to be composed of moraine-matter, deposited by a great glacier, which must at one time have pushed northward down the valley of the lake and debouched on the plain.

For the concluding operation of the Commission in the mountain ravines, a train of pack-animals was organised, and the old trail of the Kootenay Indians was followed through the mountains over the dividing ridge at an altitude of 6700 feet above the sea; thence descending on the western side the surveying operations were continued into British Columbia and finally connected with the terminal point erected by the former Boundary Commission on the summit of the Rocky Mountains in 1861, being the eastern limit to which the boundary opera-

tions from the Pacific side had been carried at that time. The old trail was completely blocked up by fallen timber, and had to be cut out afresh; the original axemen's marks were almost grown over, and had become covered with thirteen rings during that number of years that had elapsed.

The old boundary-cairn was found to be in perfect preservation, the remains of an old flagstaff, around which the stones were built, being still in position and standing out conspicuously above the top. There was no appearance of any Indian or white man having visited the spot since the boundary parties were there, 13 years ago. The beavers had, however, been very busy during this period; for at one place on the old trail they had formed a lake by constructing a dam across a narrow part of the valley, which caused the water coming from the mountains to be kept back till they overflowed the obstruction. From the mountain-summit the view embraces a sea of peaks and ridges of the boldest outline, and between these knife-edged ridges occur amphitheatres of horse-shoe form with precipitous sides 3000 to 4000 feet deep, enclosing at their bottom a placid lake, in which the waters, from their great depth, appear of deep blue colour. A great difference is observable in the physical appearance of the country on the east and west of the dividing range of mountains. To the east may be seen glimpses of the treeless plain, which extends for 800 miles to the eastward, and to the west of the mountain-range is a confused mass of rugged peaks and ridges and pine-clad valleys, which extend in almost an unbroken series for 400 miles to the Pacific coast.

During the 10 weeks of magnificent summer weather, the Joint Commission had completed the surveying operations comprising 350 miles of boundary, to the terminal point on the summit of the Rocky Mountains, and the British Commission commenced their retreat eastward from the mountains on 29th August. Official information had been received from the Canadian Government at Ottawa that the Indians intended to attack us on the march homewards. They were known to be in great force in the neighbourhood—the Blackfoot tribe alone numbering 6000 warriors—and their scouts were seen to be watching our movements. The fact was rather ominous that none of their chiefs had visited our camp, so nothing was known of their intentions or of the light in which they regarded the proceedings of the Commission. We commenced our retreat at a much earlier date probably than they had expected, and as we were then collected into sufficiently large parties to protect ourselves no molestation was offered. The camp was always formed by the waggons being arranged in a circle, and into the enclosure so formed the horses were driven at night.

The tents were pitched around and outside the waggons, while sentries patrolled the outskirts of the camp.

The depôts were necessarily kept in charge of a few men only, and the commissariat-trains travelling from point to point with no escort would have been an easy prey to the attacks of hostile Indians, and some anxiety for the safety of the smaller parties was occasioned by large bands of Indians, numbering 200 and 300, coming at different times to the supply depôts and demanding food. All the Indians of the plains were well mounted and armed with breech-loading rifles, which they procure from the Missouri River traders. Although they paid their visits with friendly assurances, it was evident, from their being in great force and well armed, that they were prepared for any emergencies. It was owing to the firmness and tact of the members of the Commission, and the discipline infused by the small detachment of Royal Engineers, that the most friendly relations with the Indians were maintained.

The transport-animals had greatly recruited during the fortnight's detention at the mountains, where the pasture was most luxuriant, and they were in excellent condition for the long march to the east. By the 19th September the whole of the *British Commission* were collected at Woody Mountain, having accomplished 410 miles of the march homewards in 22 days. From this point to Red River hay had been made and stacked at 20 miles' intervals, in anticipation of the equinoctial snowstorms and the destruction of the natural grass by prairie-fires. The autumn season of 1874 was, fortunately, most favourable, and the homeward march to Red River was accomplished without casualty, 861 miles in 43 days. The trains of oxen had been despatched from the Rocky Mountains three weeks earlier, and they reached Red River a week before the horse-trains and the main body of the Commission. Special mention must be made of the extraordinary power and endurance of the oxen. They commenced their march from Moorhead in Minnesota early in May, and from that time till their return to Red River on 5th October, they marched 2400 miles with loaded waggons out and back, at an average rate of travel of 16 miles a day. During the whole of this period they had no other food except such pasture as the country afforded on the march. The horses, on the other hand, received a daily ration of 10 lbs. of oats per diem, and were able to average 22 miles a day with loaded waggons, while on emergencies they were able to make much longer marches, when the want of water or some special occasion required it. The general arrangements of the season just described necessitated the supplies being transported by our transport-train over a line lengthening out at last to

900 miles, and the establishment of supply-depôts at seven intermediate points, averaging 120 miles apart. Two-thirds of the *personnel* of the expedition were employed in administering to the wants of the remaining third, who were actually employed in the operations in front.

The 900 miles of boundary-line between the Lake of the Woods and the Rocky Mountains may be divided geographically into three distinct steppes or prairie-levels. The first extends from the Lake of the Woods to the Pembina Mountains, and has an average altitude of 800 feet above the sea, with a width in longitude of about 130 miles. It consists principally of rich fertile land, with a considerable amount of timber in the Lake of the Woods district. The second prairie-steppe extends from Pembina Mountain to the Great Coteau of the Missouri, 250 miles of longitude, and has an average altitude of 1600 feet above the sea, with good pasture, and a small supply of wood in the valleys. The third prairie-steppe extends from the Great Coteau to the foot of the Rocky Mountains, 460 miles in longitude, and has an average altitude of 3000 feet above the sea. Much of this district is semi-desert, though pasture, in more or less quantity, is found everywhere. These three prairie-steppes have a marked dividing line at the Great Coteau and Pembina Mountain, but they have also a regular ascent to the westward of about 4½ feet in a mile, while, looking northward from the boundary, there is also a gradual descent to the Arctic Ocean. The lowest point along the whole boundary now described is at Red River, 750 feet above the sea. The Lake of the Woods in the east is 1000 feet, and Waterton Lake, in the Rocky Mountains, 4200 feet above the sea.

The whole boundary from the Lake of the Woods to the Rocky Mountains is now marked by stone cairns or earthen mounds at 3-mile intervals across the great plains, and by iron pillars at 1-mile intervals, for 135 miles throughout the southern boundary of Manitoba. As this prairie is destined before many years have passed to be the great granary of the Dominion, and from its enormous agricultural capabilities much of its produce will, in course time, come to Great Britain, it may be permitted to add a few concluding remarks concerning the present condition of Manitoba. The soil of Manitoba is mostly prairie covered with grass, and is a deep alluvial deposit of unsurpassed richness. It produces bountiful crops of cereals, grasses, roots, and vegetables. The soil is so inexhaustible, that in some places the old settlers have raised a crop of wheat off the same plot of ground for forty successive years. The wild grasses of the country are particularly favourable for stock-raising of all

sorts, as the grass of the prairie is very nutritious, and the supply inexhaustible. It is more profitable to cut the grass for the winter season and to shelter the stock, than to allow them to run. The grass can be cut by machines, and roughly stacked around the stock-yard. Wool-growing would be most profitable, as it is easily exported, and would command the same price where land is dear, and where hay has to be raised on cultivated farms. Moreover, the winter food of sheep and oxen—such as turnips and carrots—can be raised with great advantage on prairie soil.

The climate of Manitoba is one of great extremes. The situation of Manitoba is peculiar, being in the middle of the continent, nearly equidistant between the Pole and the Equator, and the Atlantic and Pacific Oceans. The snow goes away and ploughing begins at the end of April. Crops are often harvested in ninety days from the time of sowing. This is due to the long sunny days of summer, which bring vegetation of all sorts to maturity. Snow on the prairies does not fall to a greater average depth than 18 inches, and horses can graze out all winter, scraping the snow. Cattle in the spring are quite fat after the winter's feeding.

The drawbacks to the country are:—

1st. The want of markets.

2nd. Ravages of the grasshoppers.

3rd. Occasional summer frosts. The first great drawback is already in course of removal, as it is expected that in the course of a few months railway communication will be completed northwards from Minnesota to Winnipeg, the capital of Manitoba. This will bring the new province within fifteen days of Liverpool, by a route available all the year round.

Already the Canadian Pacific Railroad is in active progress, the work being carried on from Fort Garry eastward, while some sections of the railroad north of Lake Superior are staked out on the ground. Thus the Red River settlers will soon have two outlets to the ocean for their produce, and the competitions between these two railroads will doubtless keep the railway rates and fares at a minimum. In the mean time the Government route from Lake Superior to Fort Garry is very greatly improved every year, and steamers are already plying on many portions of the route where the water-communication is continuous. By this route emigrants are conveyed to the new Province at a nominal charge.

The plague of locusts is undoubtedly a most serious drawback. The ravages of this insect have been widespread over the Colony for the past four years. We read, however, that there was no invasion of this pest in the colony for 36

years—from 1820 to 1857—and the settlers are not disheartened, for I have recent information that a greatly-increased area of land is to be put under cultivation this spring.

The summer frosts occur rarely, and then confine their injuries to fruit-trees and delicate plants; and sometimes the wheat-crops suffer. The oat-crop is rarely injured, and the root-crops are certain to succeed.

The wave of emigration has set in steadily during the past four years. The Mennonites, from Odessa, are pouring into the Colony, and have already established themselves on the Prairie along the boundary. They found water readily by digging from 18 to 25 feet, and the scarcity of wood is thought nothing of, as they are accustomed to use bundles of straw for fuel. A colony of Icelanders has also settled in the Province, and are well satisfied with their new home.

The settlements to the west are increasing rapidly along the projected line of railroad. A steamer has recently ascended the Saskatchewan River to Fort Edmonton; the line of telegraph will be completed to that point in the course of a few months. The surveying parties from opposite sides are working towards each other in the Rocky Mountains for the railroad-route in that section. The Government have recently paved the way for settlers by appointing magistrates to different points throughout the new territory to the Rocky Mountains; and the civil authority is maintained by a force of 300 mounted police, under Captain French, of the Royal Artillery, who has already established the most friendly relations with the Indians throughout the country. The Canadian Pacific Railroad will pass through a fertile belt of country, the greater part of which will, in course of time, be occupied by an industrious though scattered population. The snowfall along the line of route is less than at Red River, and much less than in the eastern parts of Canada; and one great disadvantage to this part of the country, namely, the want of wood for fuel, will be met by developing the great coal-fields of the Saskatchewan, where bituminous coal abounds.

APPENDIX.

In order to define the boundary-line or 49th parallel of latitude on the ground, successive points along the boundary were determined by astronomical observations on that parallel of latitude, and the intervening spaces of boundary would naturally be defined by east and west lines, with the proper allowance made for the curve of the parallel to the north, connecting the successive astronomical stations. It was found, however, that at all these stations there was more or less local attraction, due to irregularities in the

density and figure of the earth, deflecting the plumb-line from a truly vertical direction, and the successive astronomical stations, although accurately determined to be in latitude 49° N., were found to be on different parallels of latitude, when connected by actual surveyed lines. Discrepancies of this kind were always found to occur, so that the parallel passing through one station would not, if traced with the proper allowance for curvature, be identical with the parallel passing through the next station, and so on. It thus became necessary to decide whether the points determined astronomically to be in lat. 49° N. should be simply joined, or whether a mean line parallel to the Equator should be adopted. The opinion of the Astronomer Royal was taken on this point, which was to the effect that there should be no departure in the smallest degree from the points determined by the actual use of astronomical instruments. It was thereupon agreed between the British and United States Commissioners that the astronomical determinations of each station should be adopted, and the intervening boundary-marks between the stations should be set up on lines connecting the adjacent astronomical stations having the same curvature as the 49th parallel of latitude, but not necessarily parallel to the Equator. Thus the work of marking the actual boundary-line proceeded *pari passu* with the establishment of the astronomical stations. The method of determining the latitude which was agreed upon by the Joint Commission, was by observing the differences of the zenith distances of north and south stars with the zenith telescope. The local time for the reduction of the zenith telescope observations was obtained by the use of the sextant, by the transits of zenith stars observed with the zenith telescope, or by transits observed with the portable transit. These instruments were mounted on massive tripod stands specially made by Mr. Simms for the Expedition. The stands were packed quite flat when they were taken to pieces, and were transported very easily.

The method of working generally practised by the astronomical parties was as follows:—On approaching the site selected for an astronomical station, usually at about 3 P.M., though sometimes much later, the first step was to select, for the observatory tent, an elevated spot from which an uninterrupted sight-line could be obtained to a distance of about three-fourths of a mile, either due north or due south. The camp was then pitched at a short distance off, so that neither the north or south, nor the east or west lines from the observatory tent came within 100 yards of it.

The true time of the last astronomical station having been brought forward on a pocket mean-time chronometer, or sometimes on an ordinary watch, the sidereal chronometer was started by it, allowance being made for the difference of longitude obtained from the reconnaissance sketches; and observations for time on the sun in the west were taken with a sextant for combination with equal altitudes the next morning. The zenith telescope was next mounted and adjusted, the direction of the meridian being obtained by observation of the transit, according to the time by account, of a circumpolar star as soon after sunset as practicable.

When darkness had set in, the latitude observations were commenced, a correction to the approximate time being soon obtained by taking transits of two zenith stars, and were continued throughout the night until dawn began to appear, the meridian being also altered if necessary during the course of the observations. The next morning equal altitudes were taken on the sextant corresponding to those obtained the previous evening, and the true chronometer error during the night being now known, the computers could set to work at once to reduce the latitude observations. A first value of the latitude of the zenith telescope was obtained before the afternoon, and a spot was selected the proper distance north or south of it, so as to be nearly on the 49th parallel, and, if possible, on the meridian of the instrument, from which

point the sight-line, tangent to the parallel, should be commenced; a view of nearly a mile due east or west, and also north or south being essential. The 7-in. theodolite was mounted here, and as soon as Polaris could be found in the evening, an approximate meridian was established and a mark set up. The theodolite was then replaced by the portable transit-instrument which was directed on this mark. All this could generally be done without interfering with the zenith telescope observations for latitude, which it was important to complete as soon as possible. These were continued on the second night without interruption; but in the early part of the evening, and from time to time during the night, opportunities would occur for observing the transits of stars across the meridian of the transit instrument. The azimuth of this meridian was thus obtained within one or two seconds, or less, of arc. On the second day the computations were continued, and preparations were made for commencing the sight-line to connect with the station to the west. For this purpose the 7-in. theodolite was placed over the spot where the portable transit had stood, and an angle of 90° was turned off to the west, giving a line approximately tangent to the parallel. A mark was set up on this line at a distance of about three-quarters of a mile, or more, if possible. The angle between this mark and that in the north was then read off on different parts of the arc, and in reversed positions of the face of the instrument, and the mean of these angular readings, combined with the azimuth of the meridian, gave that of the sight-line, which was generally a few seconds north or south of west. The sight-line was now ready for prolonging westward; its deviation being left uncorrected, but being taken into account in computing the offsets to the parallel. On the third night the zenith telescope observations were continued and completed, subsidiary observations for correcting the constants of the instrument being taken if required.

On the third and fourth days the computations were finished and checked, and as soon as the final value of the latitude of the zenith telescope was obtained, the required measurement to the parallel was made, and the mound marking the station erected. During the fourth and fifth nights additional observations for azimuth were taken, as well as any additional ones required for the latitude. The sidereal time was obtained from day to day by equal altitudes of the sun, and also by observations of the transits of zenith stars at night.

The time of completing a station, which, according to the above description, would be four days and five nights, was actually always more than this. Sometimes the first night could not be used for latitude observations, owing to the party having arrived too late at the station to make the necessary preparations; and one night out of three was generally cloudy or unfavourable to observation owing to thunderstorms or gales of wind. The average time necessary to complete one station was seven days during the summer months. In order to provide against delays from cloudy weather, it was always the object of the officer in charge of the astronomical work to obtain, as early as possible, an approximate value of the latitude, within 20 or 30 feet, and an approximately true meridian; having obtained these, the tangent-line could be commenced, and, in the event of cloudy weather setting in, could be prolonged for 9 or 10 miles, while, if the sky remained clear, the astronomical observations were carried on to completion.

When the astronomical station was completed, and the monument marking the parallel erected, the camp was shifted to some spot where water was to be had, about half-way to the next astronomical station. During the march, the line was run with the 7-in. transit theodolite from the initial point, or from wherever it had been already taken to, while the party was encamped at the station. From the new camping-ground the line was continued as far as the next astronomical station, if possible; but if it was not within working distance, the camp was again shifted to an intermediate point. The pro-

longing of the tangent line was done with the 7-in. transit theodolite, each point in advance being determined by two observations with different faces of the instrument, to eliminate the residual collimation and errors of level adjustment. The time occupied in running an average distance of 20 miles of line was about four days, to which three more must be added for laying down the offsets from the tangent to the parallel, where the monuments or mounds were to be erected.

Azimuth observations were taken at or near the end of the line to verify its direction, and any small error which had accumulated in the process of laying it down was distributed over its whole length.

When this work was finished, the party started for their next station, about 80 miles further west, on arriving at which the same process was recommenced.

Working parties under an officer were employed to construct the permanent boundary marks, at the points indicated by the surveyors at about 3-mile intervals. These marks were either earthen mounds, substantially built, 7 feet high and 14 feet diameter, surrounded by a circular ditch, or were composed of boulder stones, whenever they could be procured in the neighbourhood, compactly arranged and forming a conical cairn. Throughout the province of Manitoba, for 135 miles, the boundary was marked by iron pillars set up at mile intervals.

In connection with the marking of the actual boundary-line, an instrumental survey was made, by the Joint-Commission, of the country 6 miles on both sides of the line, and an exact map prepared of the rivers and well-marked features of the ground. The system pursued by the British parties was to traverse, with the 5-in. theodolite and chain, the watercourses and ridges from their intersection with the boundary up to the 6-mile limit. The traverse line was then carried due east or west, as the case might be, and check lines chained at intervals of 6 or 9 miles down to the 49th parallel. The topographers, following the chained lines as a base, were able to sketch the features occurring in the intervals not actually surveyed. The sketch-sheets were plotted on the scale of 4 inches to one mile, and each sheet represented a block of 3 miles square. All these sheets fitted together like the squares of a chess-board, and were reduced afterwards to the scale of 1 inch to a mile.

The observations for latitude and longitude, taken on the reconnaissance for fixing the approximate position of the astronomical stations, and for making a sketch-map of the country, were taken with an 8-inch sextant, the sun and the stars both being used. The sextants made by Messrs. Troughton and Simms for this expedition were perfect instruments of their class. A set of ten observations on a north and on a south object could always be depended on for determining the latitude within 100 yards. In cases where combined observations of objects on both sides of the zenith could not be obtained, the instrumental error of the sextant which had been investigated was applied. On the march the instruments were carried in a light spring waggon, and were always at hand for taking observations on the sun during the day, at the hours best suited for finding the time and latitude. For the longitudes, the local times calculated from five observations on an east and west star, moving rapidly in altitude, were compared with that brought forward on four mean-time pocket chronometers, whose travelling rates were ascertained by taking them back to the starting-point, and observing for time there after each reconnaissance; the resulting differences of longitude so obtained over distances of 100 miles and upwards, served as a check on the survey. The reconnaissance sketches were based upon the successive points fixed astronomically in latitude and longitude, and the natural features along the line of travel were sketched in with the aid of a prismatic compass.

VIII.—*The Valley of the Tibagy, Brazil.* By Thomas P. Bigg-Wither, Assoc. Inst. C.E.

[*Read*, June 12th, 1876.]

In the year 1871 a concession had been granted by the Brazilian Government to the Baron (now Viscount) Mauá and others, for the survey of a line of railway and steam-ferry communication between Curitiba, the capital of the province of the Paraná, and the town of Miranda, situated near the western boundary of Brazil, in the province of Matto Grosso.

The route, as laid down in the concession, was to pass through Colonia Thereza, and down the Ivahy Valley, to the Paraná, and thence up the valleys of the Ivinheima and Brilliante, and across the dividing ridge into the valleys of Nioac and Mondego, upon which latter river, a tributary of the Paraguay, Miranda is situated.

This survey was commenced in the month of August in the following year, and the author was engaged, in conjunction with three other engineers and a staff of Indian and Brazilian workmen, in exploring that section of the Ivahy Valley which lies between Colonia Thereza and the Corredeira de Ferro, or "Iron Rapid."

The country between these two points was found to be generally broken and mountainous, and covered by dense tropical and semi-tropical forests, uninhabited, except by tribes of wild Indians, the most formidable of whom, namely the "Coroados," were chiefly collected in the district lying between the Salto das Bananeiras and the "Iron Rapid." It was the presence of these Indians on the line of the exploration, and their avowed hostility to the objects of the expedition, that threatened to impede, if not entirely to prevent, the completion of the survey. The men of the staff being mostly Brazilians, were imbued with a strong traditional dread of even the name of "Bugré," or "Wild Indian." Consequently on the sudden appearance in the camp, a year and a half after the commencement of the survey, of a number of wild Coroados, a panic seized them, and the endeavours of the engineers were fruitless to stop it. So far did it go that, in the dead of night, it was discovered that a conspiracy was in progress for deserting the engineers in mass, and this was only stopped by threats of extreme measures.

With such men it was useless to attempt continuing the exploration, and it was accordingly found necessary to abandon it for the time, and retire up the river.

Now, on referring to the Map it will be seen that there

is another obvious route by way of the Tibagy Valley, by which the high prairie-land district of the province might be connected by a road and water communication with the Paraná River; and, moreover, this alternative, on the face of it, appears to possess at least equal, if not superior, facilities to those afforded by the original Ivahy route. The most difficult portion of the latter for the construction of a railway, namely, the lofty intervening range of hills, which forms the watershed between the two valleys, would be altogether avoided; and if it could be ascertained that the passage cut by the Tibagy through the Apucarana range was something more than a mere deep gorge or cañon, and was wide enough to allow of a road being constructed between the river and the mountains without the necessity of making a second Mont Cenis tunnel, the advantages of this route would become still more obvious.

It should be mentioned here that the Paranapanéma, from the mouth of the Tibagy down to the Paraná, can be rendered navigable for steamers of light draught at a comparatively small cost, there being but two or three slight obstructions which would have to be overcome.

It was decided, then, that a preliminary exploration of this new route should be undertaken, while at the same time another attempt was being made to complete the original Ivahy survey. As to the result of this latter attempt, it may be stated that it ultimately proved entirely successful. Under the able conduct of Mr. Faber, who was assisted by a large staff of thoroughly experienced engineers, the whole remaining survey of this section was completed in the face of more than ordinary difficulties by the end of the year 1874. At the time now referred to, however, such happy result was of more than doubtful probability.

In the month of May, 1874, the exploration of the Tibagy Valley was commenced by the author. The little village of Conchas, situated on the banks of the river, at an elevation of about 2400 feet above sea-level, being taken as the starting-point.

One of the principal objects of this exploration was the obtaining of a sufficiently accurate plan and section of the course of the river itself, in order to form a backbone, as it were, to all other observations.

To accomplish this satisfactorily, it was necessary to navigate the river for its entire length; as, although in its upper course down to some little distance below the town of Tibagy, the country on either bank is "campo," or open prairie, yet, on account of the many affluent streams and rivulets which, as in all mountainous countries, cut up the banks of the river at

intervals of every few hundred yards or less, locomotion by land would probably prove to be not only the more tedious, but also the more difficult means of progression of the two.

From the Freguezia das Conchas down to where the Rio Pitangui enters (a distance of about 34 miles), the river pursues an even winding course, with no appreciable variations either in depth or width of channel. The declivity of its bed is here also very slight, and, with the exception of one small cascade caused by an eruption of "trap" rock, it has no obstructions whatever, and is navigable throughout, even in the driest seasons of the year, for boats or canoes drawing up to 1½ foot of water.

The geological formation of both sides of the valley is sandstone overlying granite, which latter occasionally crops out on to the surface on the surrounding prairie.

The land is not generally fertile, except at some distance from the river on the south-west slope of the valley, where beds of clay and gravel predominate, and forest commences.

In marked contrast, however, to this upper portion of the river and valley is the general character of the section below, namely, that lying between the river Pitangui and the town of Tibagy, a distance by water of about 30 miles.

Hitherto the river has been winding peacefully along through an elevated and comparatively level plateau; it has now, however, approached the verge of this plateau, and the big retrograde bend which it here makes, seems to show that an obstacle has at last been encountered which cannot readily be passed. Eventually, however, an outlet is found, and, leaving the level plateau of this upper region, the river now enters upon a wild course of headlong, impetuous destruction; tearing its way down a succession of long, inclined planes, till it reaches, after falling 600 feet in the short distance of 30 miles, the town of Tibagy. Here, once more, it appears for the time at least to have found its proper level, and subsides for a brief space into its former calm and even flow.

The journey over this latter portion of the river was exciting in the extreme—the roar of the waters, the shouting of the men, as rapid after rapid was shot in quick succession, in conjunction with the general wildness of the surrounding scenery, combined to produce an impression upon the mind impossible to describe. Nor was the descent accomplished altogether with impunity. Of the two canoes forming the meagre locomotive outfit of the party, one had been, on first entering the rapids, unladen and employed as a pilot for the other and bigger canoe. This canoe by some unlucky chance allowed herself to be drawn unawares into the midst of one of the most dangerous

of the rapids, which might almost be called a cataract, and, being old and rotten, was soon smashed to pieces amongst the rocks. Of the two men in her, both were seriously bruised and knocked about, and one was with some difficulty saved by his companion from drowning. With this unfortunate exception, the journey so far was successfully accomplished, and the objects for which it was undertaken duly attained.

It was observed on this descent that all the chief waterfalls and cataracts were caused by "trap" rock eruptions; the normal sandstone formation not appearing to possess the requisite hardness and strength to enable it to resist the constant wear and tear of the water, and the occasional enormous strains which are put upon all such obstructions in time of floods. The exceptions to this general rule, which was observed to hold good throughout the whole course of this river, were in those cases in which the "trap" had vitrified and hardened the stratum through which it had forced itself.

A noteworthy example of this was seen in the case of the Salto da Conçeição, where a triple wall of vitrified schist, basalt and vitrified sandstone rears itself up vertically from the bed of the river, and traverses it in a straight line across, and, by thus damming up the water above, forms a beautiful waterfall of 35 feet vertical drop.

It was also remarked that for some distance above the bigger waterfalls—a distance varying with the height of the fall—the river was free from obstructions. Thus, in the case of the "Salto Grande," or "Big Fall," where the river drops 114 feet in only 800 yards, there occurs immediately above it a stretch, 9 miles long, of perfectly smooth, deep water. This is the longest reach by far of unbroken water that exists in this river, from where it first leaves the level plateau above, down to the point of its own junction with the Paranapanéma, a distance of about 270 miles.

A remarkable difference was also noticed in the relative fertilities of the two parts of the valley, above and below the Pitangui River. On the upper plateau, as before stated, the soil was not very fertile, and cattle were never found to fatten well upon its pasture. In the lower portion, on the contrary, cattle thrive luxuriantly, and many kinds of richer grass, which are not found on the plateau above, here grow in abundance. It seems as though there existed some mysterious connection between the character of the river and the fertility of the corresponding sections of the valley—as in both the change is sudden and simultaneous, and the boundary-line sharp and well defined—though to all appearance the geological character of the country remains unaltered.

This is, however, no doubt due simply to the vastly greater number of trap-rock eruptions, which begin to occur immediately after leaving the plateau. These eruptions no doubt extend to the valley on either side of the river, and by exposure to atmospheric influences, the "trap" is continually decomposing and fertilising with its products the otherwise poor and sandy soil.

This prairie land attains to its greatest richness in the neighbourhood of the town of Tibagy, immediately before it merges into the still richer forest-land beyond.

It may here be observed that although on a map a line of demarcation between forest and prairie may be shown, in *nature* no such strictly-defined division exists. There is no hard-and-fast line separating the two. The one merges into the other gradually; and the boundary between them would therefore be more accurately shown by a broad belt than by a single line.

In spite of the want of good roads and the consequent difficulties of transport, cattle as well as considerable quantities of vegetable products, such as beans and farinha, find their way from this part to the markets of Castro, Ponto Grosso, Curitiba, and Antonina, as well as into the chief towns of the adjoining province of São Paulo.

In the immediate neighbourhood of Tibagy there are large deposits of clays and gravels, in which latter diamonds were first discovered about thirty years ago; and it was this discovery that led to the formation of the present town, which, though the diamond-mines are now no longer worked, still gives sufficient evidence of its progressive prosperity.

The working of these diamond-mines was discontinued some four years ago, not on account of their exhaustion, but because the depth which the diamond-bearing stratum had then reached below the surface of the ground made their further working no longer profitable with the both limited and indifferently-managed resources at disposal. Statistics obtained on the spot and verified, where possible, from independent sources, and a careful examination of the mine itself, convinced the author that, though abandoned for the present, they are yet capable of being worked to further large profit.

The climate of the whole of this upper part of the valley is temperate. In the months of May and June the nights are generally frosty, but the days are bright and warm. The extreme ranges of temperature throughout the year may be taken as from 28° to 100° Fahr.; the lowest being in June, and the highest in January.

The air is most invigorating; and, contrary to the usually

received opinion, that the nearer the equator the greater becomes the requirement for stimulants, on these prairie regions the human constitution feels a *less* craving for stimulating drinks than it does in higher latitudes.

The rainy season is not well defined, but generally the months of December, January and February are the wettest in the year—though heavy rains occasionally fall in the month of July.

Statistics of the annual rainfall in these parts are altogether wanting; but it is certainly very much less than that on the sea-coast, along the line of the Serra Geral. Probably it would amount to from 40 to 50 inches, as an extreme calculation.

The unanimous testimony of Europeans who have lived or travelled in the prairies of this province is, that the climate ranks second to none in the world in point of salubrity. And certainly the valley of the Tibagy is no exception to this universal rule. In fact, no disease now exists amongst the inhabitants. There is, however, an island in the river at some distance below the town, called *Mumps Island*; and a tradition exists of that disease having once appeared, many years before, amongst some diamond-washers who were there working. Fever of any kind is altogether unknown.

The population of the town of Tibagy, including the district for a radius of 10 *miles* round, is about 3000. The people, who have the blood of three distinct races in their veins, namely, Indian, Negro, and Portuguese, are agricultural in their pursuits; and, if neither hardworking nor enterprising, are certainly a frugal and contented race. Their triple nature exhibits an odd mixture of good and bad qualities, and is only to be understood by long and intimate acquaintance with them. Hospitality to all comers is their great creed, and one which the traveller most appreciates. General laziness, both of mind and body, is the characteristic of all but the richer class of the people. This bad quality certainly cannot be produced by the climate, but is, more probably, inherent in their nature itself; and is, no doubt, fostered by the extreme ease with which their livelihood can be always obtained. The result is that, with the wealth of a kingdom around them, they are content to pass their lives in a state but little less brutal than that of the wild Indian himself.

This picture is only a reproduction of what may be seen in so many other of the outlying settlements of the interior of Brazil; and the thought cannot help forcing itself upon the mind of the traveller who sees all this, that the people are not worthy of the country.

On the 5th of June the journey was resumed by land from

Tibagy, as it was thought wiser to explore the river upwards from Jatahy, in order that the risk of disaster in navigating its many unknown rapids and cataracts which were certain to be encountered, might be lessened as much as possible.

The road, which is merely a mule-track, runs along the north side of the valley at some distance from the river, as shown on the Map. The slope on this side of the valley is very rapid; Fortaleza being 1200 and Monte Alegre 1400 feet above the level of the town of Tibagy. On the opposite side of the valley the general summit of the watershed has the appearance of being still higher.

On leaving the prairie and entering the forest the general altitude of the country apparently diminishes, but this is due merely to the nearer approach of the road to the river, and not to any sudden change in the configuration of the valley.

Pine-trees—most of them of enormous size—are here the characteristic growth of the forest; at all altitudes, that is, above 1600 to 1700 feet above sea-level. Below this line they suddenly and completely disappear, and their place is taken by other and more tropical types of vegetation. These pine-trees grow to a height of 130 and 140 feet, their trunks rising straight and branchless to within a few feet of their summits, where a multitude of long slender boughs start out horizontally from the trunk, and form an umbrella-like top of about 60 feet in diameter, which is the favourite resort, especially in the fruit season, of innumerable flocks of parrots, Brazilian jays and monkeys.

At a short distance from the little settlement of Alambary the base of the Apucarana and Agudos range is reached; and, about half-way between Alambary and St. Jeronymo, the road crosses the ridge at an elevation of 3400 feet above sea-level, and shortly afterwards emerges into an open patch of "prairie," or "campo," which (strangely enough at first sight) here rises up bare and bleak, out of the midst of the luxuriant surrounding forest. A similar patch, called the "Campo de Inhohô," appears a little nearer to the river.

These little bare patches or campos seem altogether out of harmony with the surroundings—not only in their comparative sterility, but also in the configuration of the ground. Whereas, in the forest-land surrounding them, it would be difficult to find a level spot of 5 square yards together, here you have many square miles of an almost perfect plain; and so flat is it, indeed, on these campos that a large proportion of their extent is permanently covered by swamps.

The following facts observed, appear to afford some key to their origin:—

The range of the Agudos and Apucarana is due to volcanic agency. Great masses of "trap," chiefly consisting of porphyries, have been upheaved and erupted through the overlying strata of sandstone and other formations, and have caused a vitrification of the latter at all the surfaces of contact. Subsequent to this eruptive upheaval (which must have acted with nearly equal force over large areas) dénudation came into play, carving out the steep slopes and deep valleys and ravines over which the forest has now taken possession, and leaving exposed, in such places, to the disintegrating action of atmospheric influences the highly-fertilising volcanic rocks; but on the other hand, wherever the hardness of the stratum, aided by an absence of declivity, or "dip," in its bed, over any considerable area, resisted these forces of dénudation, there level tracts have been left remaining, covered only by their hard protecting shell.

Now, as a matter of fact, these campos show (beneath a small depth of supersoil) a surface, more or less smooth, of hard vitrified sandstone; and, in one or two cases where, near their boundaries, small streams have, in the course of ages, cut their way through this upper shell, it is seen that the igneous rock lies immediately beneath, as must necessarily be the case if the above explanation be correct. The appearance of the tough prairie grass in the place of the luxuriant forest is also a necessary consequence of this theory of their formation, and thus the whole phenomenon is explained without difficulty.

These little campos, rising up in the midst of the forests, are of not uncommon occurrence; and generally, if not invariably, are found in close connection with volcanic ranges, where also sandstone is the overlying formation.

Another example, as shown on the Map, occurs on the range of mountains which divides the waters of the Tibagy and Ivahy, which range is likewise of volcanic origin.

These particular spots on the Agudos range were discovered in the year 1845, by an American named Elliott, who was exploring the country on behalf of the Baron de Antonina. He discovered them from the top of one of the peaks of the Apucarana, between 20 and 30 miles distant on the opposite side of the valley; and a few years later the present settlement of St. Jeronymo was founded, and Mr. Elliott himself, now old and broken down in health from his past hard life as an explorer, is spending his declining years on the very spot which he himself had discovered thirty years before.

As regards the passage of the river through this range, from a point at the southern extremity of the Campo de Inhohô, at an elevation of 3300 feet, a very complete view of the whole

of the south-west side of the Tibagy Valley is obtained. This view extends from the range of the Pedra Branca above the town of Tibagy, down to and even beyond the valley of the Paranapanéma, and stretches away to the westward, where no hills intervene, as far as the eye can reach.

This vast tract of rich and fertile country, embracing an area of thousands of square miles, is covered still by virgin forest, and inhabited only by a few wandering tribes of wild Indians. And thus it is likely to remain for generations to come, either until another Paraguayan war forces the Government to construct the long-meditated road down this valley, or until the country itself passes into the possession of a more enterprising people; neither of which events is perhaps likely to come to pass for many long years to come.

From this station on the Campo de Inhohô the River Tibagy for several leagues of its course lies mapped out beneath. The white lines and patches here and there discerned upon it mark the position of so many falls and cataracts, and the quickened imagination almost fancies that it hears the roar of the rapids rising up from the depth below. The distance is, however, too great.

The evidence of the river once having filled a far greater breadth of valley than that which now suffices to contain its diminished volume, is here very striking. The long lines of equi-altitudinal hills, ranged like gigantic amphitheatres opposing each other on either side—the many scarped slopes, all directed inwards and towards the centre line of the valley—these were striking features, and rendered the more noticeable from the fact that, from this elevated point of view, all minor configurations of the ground, which would otherwise have been apt to confuse the eye, had disappeared, or were visible but in their just relative proportions.

Hence it was now quite evident that the pass cut by the river through the Apucarana Range was not a mere deep gorge or cañon, but, on the contrary, was a wide valley, offering no insuperable difficulties to the construction of a railway through it.

On resuming the journey from St. Jeronymo, and after having passed the little river of the same name, the general aspect of the valley once more changes. The abrupt and mountainous region of the Agudos is left behind, or planed down into low, gently undulating hills; while, at the same time, the character of the vegetation becomes more completely tropical, and the last pine-tree disappears and gives place to the piroba, the garlic-tree, and the fig-tree, each of which rivals in its dimensions the monarch that it has displaced.

The geological formation also undergoes a change. In the place of sandstones and porphyries, a reddish-brown amygdaloid rock, with its numerous little cavities lined with the green mineral *chlorite*, forms the body of the hills and continues to be the dominant formation down to a point some distance below Jatahy; whence, down to the Paranapanema, sandstone, split up in all directions by dykes and large masses of greenstone, again takes possession. This amygdaloid formation extends in a south-westerly direction as far as the Ivahy Valley, where (notably at the "Salto da Fogueira") it assumes a somewhat different character, the cavities in its substance increasing greatly in size, and often containing agates of 4 and 5 feet in diameter, which, on being broken open, are found to be lined with brilliant and well-formed crystals of amethyst and other varieties of quartz.

These are the stones which, some 250 years ago, raised great expectations amongst the inhabitants of this province, a great number of them having been found in the bed of the Ivahy River by a party of so-called "explorers"—in reality "slave-hunters"—and mistaken for sapphires.

With regard to the animal-life of this district, an incident may here be related illustrating the extreme boldness of the jaguar, or South American tiger, which is very common about these forests.

Our little party was camped one evening on the banks of a small stream called the Tres Barras. A wild pig, which had been killed that day on the march, was hanging, suspended from the branch of an overhanging tree, in readiness for the next day's breakfast. All but one man (who, as usual, was keeping watch by the camp-fire) had retired within the tents, and were fast asleep, when suddenly the report of a pistol brought every man on to his legs, fearing an Indian attack. Nothing, however, was to be seen but a confused mass of canvas rolling and kicking about on the ground, and undergoing all manner of contortions. In another second a jaguar leaped out of the struggling mass and instantly disappeared into the forest. A few more violent contortions, and another object extricated itself from the heap, but this time it was a man, looking very much astonished and bewildered, as well he might.

It appeared that the man on watch had caught sight of the jaguar prowling about after the pig, and had at once fired his pistol at it. The animal, in its sudden fright, had bounded straight into the nearest tent, knocking it down, and burying both himself and its occupants in the folds. The latter suffered more for the next few weeks from the jokes of his companions than he did at the time from his unbidden bed-fellow.

Besides jaguars and wild pig, tapirs and deer are also very abundant.

We now come to the village of Jatahy, which is a military colony, containing about 450 inhabitants, and which, almost ever since its formation in 1852, has remained in the state of stagnation common to so many of the backwoods settlements in this country.

During the time of the Paraguayan war it was used by the Brazilian Government as a depôt for military stores, and rose to temporary activity in consequence. Upon the conclusion of the war it relapsed again into its former state though buoyed up for the time by the hope that the Government, having once proved the value of the station as a strategical point, would make some effort to open up better communication with it from the eastward than the wretched mule-track already existing. These hopes have not, however, yet been fulfilled.

The river below Jatahy is not navigable, being full of shallows and small rapids, though, during the war, the Government made constant use of it for transporting, by means of canoes, large quantities of war materials into Paraguay, though at a loss of about one-sixth of the cargoes.

Frost is here, too, unknown, and coffee, sugar, tobacco, maize, beans, and rice, besides all kinds of tropical fruits—such as oranges, citrons, bananas, and pine-apples—grow luxuriantly, the soil being of the richest quality.

A small trade is carried on with the prairie-towns in sugar and cachaça (a kind of rum). This, in addition to a certain annual support afforded by Government, is sufficient to keep the place alive. An interesting colony of semi-tame Coroados Indians, under the direction of a Padre or priest, numbering nearly 500 individuals, is established on the opposite bank of the river.

Like most of the smaller Brazilian rivers on the borders of the tropics, the Tibagy is subject to frequent and violent floods, occurring at irregular intervals.

On account of one of these sudden and unexpected rises, the author was detained at Jatahy from the 2nd to the 25th of July. After nine days of incessant rain, the river opposite the village, where it was about 200 yards broad, rose 33 feet, and the volume of water which it discharged increased from 8000 to 200,000 cubic yards per minute.

Immense trees, accompanied by an enormous amount of *débris*, swept down in endless succession during the height of the flood, and the noise of their roots ploughing the rocky bed of the river, as they were borne impetuously along in the swirl of waters, was distinctly audible at a distance of half a mile from the bank.

This was the highest flood that had occurred since the year 1859, on which occasion the whole of the lower part of the village had been swept away.

The great tug of war had now to be encountered, namely, the ascent of the river from Jatahy to the town of Tibagy, a journey of about 200 miles. Two attempts to explore this portion had already been made, both resulting in failure, on account of the torrent-like character of the river: one by Mr. Elliott, in the year 1846, and the other by the two Kellers, German engineers, employed by the Government in the year 1865 to survey this and other rivers. This section, therefore, still remained unknown and unexplored.

The floods having abated, on the 25th of July our small party of nine men, with two new canoes, especially built for this attempt, and amply supplied with provisions, started on the journey, the whole village turning out on to the banks to bid "Farewell" and "God-speed."

The bad character given to the river was not found to be exaggerated. On the 27th, notwithstanding all precautions, one of the canoes was swamped, and some provisions lost. Continuing the ascent with still greater caution, on the 9th day after leaving Jatahy we were rewarded by the sight of the Indian colony of tame Coroados, called "Colonia Nova." Here fresh supplies met us from St. Jeronymo.

On once more resuming the journey the river was found to become more difficult than ever. Day after day roads had to be cut through the forest, and the canoes dragged overland; at other times the canoes were unladen, and with the aid of chains and ropes pulled by main force up the foaming rapids. The men—six of whom were pure-blooded Caioá Indians—were all far above the average Brazilian, and were one and all imbued with the determination to overcome any and every difficulty.

On the morning of the 20th of August, nearly a month after our departure from Jatahy, this resolution was put to a severe test. The men had already begun to congratulate themselves that the worst of the journey was now over, and that in a few more days the "Campos" would be reached (as that very morning the first sign of civilisation had appeared in the shape of a dead cow cast up on the bank), when, on rounding a slight bend of the river, a spectacle came into view which overthrew in a moment all these hopeful calculations.

There, stretching across the whole breadth of the river from bank to bank, and piled up, tier above tier, to a height of more than 100 feet, rose a mighty barrier of rock and foam, waterfall and cataract, mingled together in wild confusion. Here and there wreaths of vapour, like smoke, were rising up from beneath,

and forming a cloud upon the summit. The roar of the immense volume of water falling was like deep thunder, and the whole scene impressive beyond description.

On examination this obstruction proved to be 114 feet high, and about half a mile in length. Both flanks were guarded by perpendicular walls of basalt of nearly 200 feet in height, and offered no alternative for the passage of the canoes otherwise than by making a long détour through the forest. This accordingly had to be done, and a timber-road of a mile and a half in length was constructed round the falls, and the canoes were dragged over it and again launched on the river above.

This operation, which was of a very laborious nature, took *nine* days to accomplish, notwithstanding the stimulus given during the latter part of the time by the appearance of several wild Indians of the Botocudo tribe. These Indians, however, who only live in very small families together, did not collect in sufficient numbers to give much cause for apprehension; though, from their proverbial brutish and treacherous character, it was necessary to be constantly on one's guard during that time.

On the 1st of September the River Imbauzinho was reached, where further supplies were awaiting our arrival, and on the 8th of the same month we landed once more at the town of Tibagy, having successfully accomplished, though after more than six weeks' incessant labour, a journey till then considered to be almost impossible.

As to the character of the river between Jatahy and Tibagy enough has already been said or implied; but it may be well to mark out the limits of three of the more widely-differing sections into which it may naturally be divided.

From Jatahy to the mouth of the Rio St. Jeronymo, the declivity, though great, is regular; and the river might be considered as one long rapid for the entire distance. Its width varies from 160 to 1100 yards.

From the Rio St. Jeronymo up to the "Salto Grande" the river passes through the grand mountain scenery of the Agudos and Apucarana range in a series of bounds over falls varying from 10 to 40 feet in height; and, though more difficult to navigate, the average declivity of its bed is here less than that of the preceding section. The average width of the river is also much diminished.

The next section from the "Salto Grande" to the town of Tibagy is remarkable by reason of the greater magnitude of its waterfalls proper (as distinguished from rapids or cataracts), and the general occurrence above them of long reaches of deep calm water. This section also contains gold and diamonds in

some abundance, neither of which were to be found below the Salto Grande.

The fall of the river from Tibagy down to its mouth is about 950 feet; making, therefore, the total fall, in a length of somewhat less than 300 miles, to be 1550 feet.

The exploration which has been attempted to be described, besides fulfilling the especial objects for which it was undertaken, has added also one more to the lengthening list of Brazilian rivers whose course has now been surveyed and mapped down.

Small and insignificant as the valley appears on a map of Brazil, yet from its position, connecting the great navigable water-system of the Paranapanéma, Paraná, Ivinheima, and Brilliante with one of the best harbours on the east coast (for a first-class carriage-road has already been constructed up the most difficult part of all, namely, the "Serra do Mar," between Antonina and Curitiba), it is of greater importance than many a larger and richer valley.

As has already been seen, it contains within itself every variety of climate, from the temperate to the tropical, and is suitable for the production of all kinds of necessary food. It has its pastures for the breeding of cattle, and its rich forest-land for the cultivation of the various kinds of vegetable produce. Water and timber abound everywhere, and the climate throughout is unsurpassable in its salubrity.

What, then, is wanting in order that these great natural advantages may be utilised? The answer seems plain. What is wanting is a more enterprising, energetic, and, above all, honest race to take the place of the mongrel native. With this change everything else would follow. The Government is already liberal in its support, but, as everybody there knows, not one-tenth of the funds supplied ever go to their legitimate object. They are, in plain language, appropriated by the various officials through whose hands they have to pass.

It is this pervading low standard of morality which has hitherto paralysed, and will still continue to paralyse, the development of the country. Yet, in spite of all, some progress may be observed to be going on, notably in the district round the town of Tibagy.

Now, of all parts of the province of Paraná, this district is the most suitable for the foundation of an English colony. If, therefore, instead of spending thousands of pounds in the attempt to establish an English colony at Assungui—about which we heard so much a few years ago, which place, buried as it is amongst a mass of hills, mountains, and impenetrable forests, is altogether unsuited for its purpose—the same money had

been spent in founding the colony on a spot whose progressive capabilities were a matter of certainty, and where ample room existed for its development, much credit might have been saved to the Brazilian Government, and great profit gained by both parties.

The advantages which this district would afford to the English settler over that of Assungui may be briefly summed up as follows:—More suitable climate; pastoral as well as agricultural land; and more central position with reference to markets for produce. If English colonisation is ever to succeed at all in this province, it must be planted in some such locality as this, and not in the utter depths of isolation in which Assungui is buried. Let, then, the Assungui attempt be abandoned; the colony transferred to the neighbourhood of Tibagy; and the nucleus formed somewhere on the borders of the forest,—not in its far depths.

At Curitiba a large and thriving German population has sprung up out of very small beginnings—and why? Simply because the country and climate are suitable to the people, and there is a market for their labour. At Assungui these conditions are conspicuous by their absence; but at Tibagy they exist to an equal degree with Curitiba, and, for an agricultural colony, no part of the whole province could be better fitted.

New blood would in this way be introduced where it is most wanted, and where it would have the greatest effect. The laws of natural selection might safely be trusted to do the rest. And thus this rich and fertile valley, with an area of nearly 20,000 square miles, would have some chance of attaining, at no distant day, to a position worthy of its great resources.

At present, it must be remembered, it is, like many another rich but not easily accessible country, scarcely known even in its own province, and to the outside world it is altogether a "Terra incognita."

IX.—*A Prince of Kâshghar on the Geography of Eastern Turkistan.* By R. B. SHAW.

[*Read*, June 26th, 1876.]

THE interest attaching to the mountain-region surrounding Kashgharia, of which portions have been recently brought to notice by the explorations of the several parties detached by Sir T. D. Forsyth's Mission, makes it worth while to review

what we know of the remainder, so as to ascertain how much has still to be done before our knowledge is complete.

I have been chiefly led to do this by reading the graphic account of these regions given by Mirza Haïdar,* a Prince of the Royal family of Kâshghar, and a contemporary and connection of the Emperor Baber, the first of the Great Moghuls of India. Moreover, though I have not had an opportunity of making any personal explorations in the hill-country west and north of Kashgharia, beyond the determination of the position of several peaks and ridges visible from the plain-country, still I have been able to cross-examine several intelligent natives who have been there, and I have formed to myself a pretty definite notion of some of the natural features; subject, of course, to subsequent correction.

Mirza Haïdar thus describes the general characteristics of the region:—

"The mountains of Moghulistân [the Muzart and Thian-Shan Range], from which all the other mountains branch off, passing round the north of Kâshghar, come round to its west, and go off by the south of that city. . . . The province of *Farghâna* [Andijan or Khokand] is in the west of Kâshghar, and these same mountains lie between; and that which is between Kâshghar and Farghâna is called Alaï.†

"*Badakhshân* is on the west of *Yârkand*, and there also these mountains intervene. That which lies between Yârkand and Badakhshân is called *Pâmir*. The width of Pâmir is, in some places, seven or eight days' journey. When one has passed this, there are some of the mountains of Yârkand which adjoin *Balor*, such as *Raskam* and *Tâghdumbâsh*; and when one has passed these, the rest is land belonging to Tibet."

Here we must remember that the writer is in imagination travelling with the mountains, following their curve as above described, which leads him first into the Alaï plateau, then into the Pâmir, thence into a region where Balor is conterminous with the districts of Raskam and Tâghdumbâsh, and finally into the Tibetan provinces. This is quite a correct account. Regarding Raskam and Tâghdumbâsh, it is sufficient to say that these names are current at the present day. The districts ‡

* In the 'Tarikh-i-Rashidi,' a book written by him about the year 1543 A.D. towards the end of his life, in Kashmir, of which he was then ruler. It was at one time hoped that a translation of this work, by the pen of Sir H. Rawlinson, would appear.

† One of the routes (which will be given presently) leads across a corner of the Alaï.

‡ Marco Polo seems to have considered them part of Balor, to judge by the direction in which he says Balor lies from Pâmir. At the present day also Raskam is a dependency of Kanjut (a part of the ancient Balor).

which are so called lie on the Central Asian *versant* of the *Muztak* (sometimes, though improperly to my mind, called Karakoram) Range, in the corner between it and Pâmir. Tâghdumbâsh is grazed over by the Sarikol Kirghiz, subjects of the Amir of Kashghar. Raskam is held by the Kunjutis of Hunza-Nagar. One of the boundaries of Balor is thus very distinctly marked out. As it adjoined Raskam and Tâghdumbâsh, it must have included Hunza-Nagar.

Mirza Haïdar continues:—

"Badakhshân is in the direction of summer sunset [viz. about 30° N. of W. for that latitude; but the real direction is nearer west, in accordance with his first statement] from Yârkand, as has been mentioned.

"*Kashmir* is in the direction of winter sunset [south of west; but in reality it is very little to the west of south] from Yârkand, and the same mountains lie between. That which lies between Yârkand and Kashmir is a province of Tibet, called *Balti*. And here in the same way that Pâmir is wider than Alaï, so in Balti the width of the mountains is, perhaps, twenty days' journey. As the [chief] acclivity in the ascent from Yârkand is the acclivity of *Sanju* [so], the [chief] declivity in descending towards Kashmir is that of *Iskârdo*.* From this acclivity to that is about twenty days' journey.

"Similarly in the winter sunset [south of west] of *Khotan* certain of the cities of India are situated, as *Lahor* and *Sultânpur* and *Bajwâra*;† and the same mountains before-mentioned lie between. That which lies between Khotan and the cities of India above-named, forms provinces of Tibet, viz. *Arduk* [Rudok], and *Gugah* [Gugé], and *Aspati* ‡ [Spiti]. And this must be borne in mind, that these mountains end in Khatâï [China]."

Here we have a geographical description which shows that Mirza Haïdar was able to rise above details and conceive a general idea—a rare faculty among Orientals. The account of the mountain region sweeping round the north, west, and south of Kâshgharia, and thus enclosing that country on three sides, is the simplest and truest that can be given. Our author evidently considers all that lies between Yârkand and Khotan on

* The capital of Baltistan.

† Sultânpur is the chief town of Kullu, the valley of the Upper Biâs River. I incline to think that Bajwâra must be an old town of that name, not far from the Satlej near Phillor, from its being mentioned afterwards in connection with that river. There is also a *Bajùora* on the Biâs, near Sultânpur.

‡ Here we have that peculiarity of certain Oriental nations which prevents their being able to pronounce an *s* immediately preceding another consonant at the beginning of a word. Thus, we have *Ismit* for the familiar Smith, *Iskardo* for Skardo, &c.

the one side, and India on the other, as one great mountain-mass; in the same way as that which divides Yârkand from Badakhshân, or Kâshghar from Khokand,—only, the mass widens as it runs round by south and east. He is not troubled by any theories about the mountains of Sanju (the Kuen-Lun) not forming a part of the same mass. This mass is composed of many subordinate ridges, but they combine to form one grand system. No one of these subordinate ridges or ranges (such as the so-called Kuen-Lun) deserves to be distinguished from the general system, in any sense in which each of the others could not equally be distinguished from the rest. Looked at individually, they are ranges distinct from one another; but viewed *en masse*, they all (including the Kuen-Lun) form but one system or chain.

In another place (referring to "these mountains" which he has been tracing round Kashgharia), he says, "In winter the Champas descend the above-mentioned mountains to the west and south, *which is India.*" And again he says, "All water which flows from the mountains of Tibet [viz. the Tibetan cross-segment of the great curved chain] towards the west and south forms rivers of India. . . . . and all waters which flow from the [*same*] mountains of Tibet towards the east and north form the rivers of Yârkand, &c." Thus, in his estimation, *one* mountain-system, and not *two*, lies between the Indian and the Central Asian basin.

The idea of gauging the width of the chain by giving us lines across it in different parts, together with a statement of the countries which they lead to, is very satisfactory. These lines, radiating from the cities of Eastern Turkistân, are probably routes travelled by himself or by his informants.

With regard to the first of these, viz. that *from Kâshghar to Farghâna,* he merely says that it crosses the Alaï, and that the Alaï is narrower than the Pâmir, which is seven or eight days' journey in width. I have obtained some information regarding one of the routes between Kâshghar and Kokand, which does, in fact, cross the Alaï, and which, I think, has not yet been described. I have drawn up the accompanying sketch map, from the description and under the eyes of a very intelligent native merchant who has traversed it, and who, knowing the kindred region of Tibet well also, was able to point out to me examples in the latter country of the natural features of the Alaï which he was trying to describe. The position of the northern Passes I have taken from Colonel Walker's last map.

The lamented Fedschenko has made us acquainted with a more westerly part of the Alaï, "a table-land at the head of the Surkh-âb, or northern arm of the Oxus. At the point at

which M. Fedschenko visited this plateau, it was about 7 miles wide and 8000 feet high. Towards the east there are no mountains visible, and the plateau seems to widen out towards the north-east. On the south the Alaï is skirted by a snowy range. . . . Across these mountains, which M. Fedschenko calls the Trans-Alaï, there is a pass into Sarikol, and further east there is another pass, called *Taü Murun*, which leads to Kâshghar."* He himself crossed the range which bounds the Alaï on the north by a pass of 13,000 feet.

Now, it is across this same range further east that the *Shart* Pass leads (the *Terek*, or main route between Khokand and Kâshghar, being still further east). On crossing the Shart Pass from the north one enters the flat Alaï plateau, which is here described as a day's march across (say, 12 or 15 miles). At first small rivulets are met with, running west to form the River Surkh-âb, or Kizil-su, seen by Fedschenko. Crossing the plain transversely (south-east ?) towards the southern snowy range, one gets to the edge of a sudden depression running along at the foot of the southern mountains, like a ditch under a rampart, with the Alaï plain for a "glacis." In this depression is a small stream running *east* and coming from the *west*, where the depression itself seems to originate only a few miles off, being, in fact, a kind of fissure between the plain and the mountains. This stream flows towards Kâshghar. I am assured by my informant that the whole thing is almost exactly paralleled by the deep cut of the Sum-kyil stream at the edge of the Kiang-chu plain in Tibet (Rupshu), with which I am acquainted. Here the plain is merely the surface of a vast and deep bed of alluvium, between which and the mountains a stream has cut a channel several hundred feet deep, and correspondingly wide, through the same alluvium.†

If this comparison is exact, as seems probable from the intelligence of my informant and from independent corroboration, we have here a singular repetition of the indistinct water-partings of Tibet. For the surface of this same Alaï plain sheds its waters westward; and here, without crossing any ridge, merely by walking across a dead flat, we get to the edge of a channel which feeds the Kâshghar River (eastward). For the road follows this stream for some distance, until the rapid deepening of its bed and the precipitous nature of its banks, compel the traveller to ascend the hill-side, cross a small pass called the *Igizak* (Twins), and return again lower down to the Alaï stream, where its sides

* See 'Ocean Highways,' for August, 1873.

† [These lofty valleys, filled to a flat floor with diluvium, and affording fine pasture, appear to be the features to which the name of *Pamir* is given generically. —H. YULE.]

are less steep. Near a place called *Ok-saldi* (a former Chinese station), the stream is joined by a smaller one from the Terek Pass, and by a larger one from the north from the district of Ketman Tippa. The united stream flows towards Kâshghar, receiving smaller tributaries from both sides; but my informant shortly again diverged from the regular road *viâ* the Terek Pass, which struck into his at Ok-saldi. He reached the open country about one march from that place, after crossing a low pass and entering the mouth of a valley containing a stream from the south-west, where it debouches on the plains, and which, after reaching the village of Opal, flows away to the south-eastward.

With reference to the name "Taù-Murun" (mentioned by Fedschenko), this would mean in the Kirghiz dialect "mountain-nose" or "promontory" (Kâshghar Turki, "Tàgh-buruni"), and would be very applicable to the projecting point which is crossed by the Igizak Pass (so called probably from some other local feature). This merely surmounts a steep obstacle, returning to the banks of the same river, unlike most passes, which generally lead over a ridge into a different drainage system. But the name "Taù-murun" has not actually been mentioned to me in this connection.

Another road across the Western Mountains is given by Mirza Haïdar in a separate passage, in which he describes the rivers of Kashgharia. It lies up the valley of the *Shahnâz*, and leads from Kâshghar to Badakhshân. This introduces us to the question of the drainage of the mysterious region north of that which was the scene of Colonel Gordon and his party's late spirited and valuable exploration, and south of the Alaï; and also to that of the origin of the streams which one crosses between Kâshghar and Yârkand. I give the passage from Mirza Haïdar which refers to this subject:—

"When I say that the length of the cultivated country of Kâshghar and Khotan extends along the skirts of the Western Mountains, so that from the borders of Kâshghar (the name of the place is Artuj*) to the extremity of Khotan (which is Kiria† and Chirha) may be one month's journey; still, in the width of the inhabited portion, if one travelled quickly from the Western Mountains in an easterly direction, one would pass out of the cultivated country in one or two days.

"By the side of every river that issues from the mountains corn is sown and the land inhabited. Thus the first river is *Tuman.*‡ It comes out from the mountains which lie between

* *Artüsh*, on the road from Kâshghar to Vernoy.

† Visited by Mr. Johnson in 1865.

‡ The present city (*Kohna Shahr*) of Kâshghar is situated between two rivers which join together about two miles S.E. of the city. The larger of the

Kâshghar and Farghâna (Andijân). And this river passes through the midst of the old fortress which Mirza Abu-Bakr destroyed. . . . Many districts are fertilised by this water.

"The second river* is called *Kàrà-Tàzghun.* In the idiom of the men of Kâshghar, *Tàzghun* means 'river.'† It passes the above-mentioned fortress 3 farsangs (15 miles) to the south; and most of the districts of Kâshghar are cultivated by means of this water.

"Three farsangs from this river is another, the *Kusun* Tàzghun. The villages of *Yangi-Hissâr* are on this river, and the lands of these are irrigated from this water. From Kâshghar to Yangi-Hissâr the road is 6 farsangs.‡

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two, which washes the eastern side of the city is called *Tuman*, or Ara-Tuman, *i. e.* Middle Tuman. The other, flowing a short distance to the south (and crossed by a bridge in going from the fort to the city), is called *Kizil*. The united stream is now often called after the latter; but the name of the former seems to have prevailed in Mirza Haïdar's days.

* Mirza Haïdar here leaves out several minor streams which cross the road. About half a mile from the (new) Fort to the south (or say nearly 6 miles from the city) is a small muddy stream occupying part of a bed, which is about three or four times its width. This stream, or its branches, are variously called by the natives according to the names given to me; *Telbachuk* تلباچوک (this name I seem to have applied to the wrong river before), *Kacharchi* (from a village on its banks), and YAMAN-YAR (meaning "bad banks"). Three or four miles from this one crosses the *Faïzabad Ustang* (Canal) by a bridge, and about a mile further the *Kizil Boï* ("red length"), and the *Kàrà-su* ("black-water") within 50 yards of (above) their junction. They both seem artificial. The latter is the smaller of the two. I am told that these four above-named, all derive from the same trunk as the Kâshghar River.

About 8 miles beyond this one descends slightly into a broad depression, at the edge of which is a considerable canal, called the *Khan-arik* ("King's canal"). The depression is occupied by three or four branches of a river (larger than any of the preceding), crossed by several bridges. It is variously called *Tàzghun* (which really means "a flood") and *Yupurghi* يوپورغى. I have also heard the name *Tarim-Moghul* ("Moghul cultivation") applied to it, said to be the name of a district on its banks some 30 miles below. But this is perhaps a corruption of the words *Taram* (meaning "divaricating"), and *Gol* (Mongol for "River"); a name very applicable to the joint stream which loses itself in Lob; and which is the *Tarim Gol* of maps.

† Really "flood."

‡ This must be understood to mean to the town of Yangi-Hissâr, not to the above-mentioned villages of that district which are watered by the Kusun River. After crossing the River *Tàzghun* or *Yupurghi* (mentioned above in the note), one enters the district of *Yepchang*; this continues to the River *Kusun* (known for its quicksands), say 5 miles. After crossing this by a bridge one reaches shortly a small canal, called after the villages of *Bésh-Kent* ("five villages"), which it irrigates. Thence traversing the district of *Sughluk* and a reedy tract through which flows a small stream, called *Saïtla*, one reaches the town of Yangi-Hissâr (also called *Láwar*), which is fed with water by a small channel, called the Saïlik. All these, viz. the Kusun, Bésh-Kent Ustang, and the Saïlik are said to arise from one head. The Saïtla, I hear, is produced from certain springs rising in the plains. Two or three miles south of Yangi-Hissâr one crosses a good-sized stream, called the *Saïghan Sûï*, also said to originate in the plains. All the streams I have mentioned crossed the road from west to east.

"After Yangi-Hissâr there is an insignificant hamlet called *Kàrà-Khanak.* It may be about 6 farsangs. In front of it flows the River *Shàhnâz,* and several villages are fertilised by this water. Shàhnâz is also a valley situated in the Western Mountains, and the road from Kâshghar to Badakhshân is through that valley.

"From Kara-Khanâk to *Kilbin-Rabât* there are villages which are stages for goers to and fro. It may be 5 farsangs. Then there is another rest-house, which they call *Kosh-Gumbaz* ['Dome of Assembly']. It is a fine halting-place, and irrigated by the River Shahnâz. It possesses cultivated fields and gardens, which are all assigned to the service of this rest-house. Goers and comers have the use of this rest-house.

"The next stage is a village called *Kizil.* It has salt-water. At this stage they do not halt unnecessarily. This is the halfway stage between Yangi-Hissâr and Yârkand.

"From Kizil to *Kok-Rabât* is about 10 farsangs. From Kok-Rabât to the edge of the district of Yârkand, which is named *Rabàtchi,* may be estimated as a distance of 7 farsangs. Between Rabàtchi and Kàrà-Khanâk, besides these stages which have been mentioned, there is little other habitation."*

* To continue the description of the road as it exists now: after crossing the Saïghan-Sûï (south of Yangi-Hissâr), one traverses some low ridges of sand-hills (running nearly east and west), and enters a large, reedy plain, extending up to the skirts of the mountains to the south-west. Just at the edge of this plain, between it and the sand-hills, there is a rest-house, with a spring of water and a few trees. It is called *Suget Bulak* ("Poplar Spring"); but no one knows the name Kàrà-Khanâk here. From this, crossing the reedy plain for some miles, one reaches the cultivation of *Kilpin* (Kilbin Rabât, see above) extending along the neighbourhood of a water-course from the mountains on the south-west. A couple of miles further is the village and cultivation of *Topluk,* extending in the same way. Again the road passes through a waste, which slopes down gently from the western mountains, reaching presently the villages of *Kosh-Gumbaz, Tam-yeri* ("wall-place"), *Kuduk* ("well"), *Chumalung* and *Kizil* ("red"). The cultivation of the two former is conterminous, but spaces of desert separate the others, that between Topluk and Kosh-Gumbaz being the widest. Of all these villages it must be understood that they are long strips of cultivation, extending several miles south-westward, up the banks of the small water-courses which feed them, and that the road passing from north-west to south-east (roughly) crosses their narrowest direction, which varies from a quarter to half a mile, or a little more. From Kizil to *Kok-Rabât* is a long desert tract, known as *Ahmad-Sàyi,* with a single well and rest-house, called *Ak-Langar,* about half-way. On leaving Kok-Rabât one turns more to the east, and enters a broad tract of country consisting of sand-hills separated by reedy and marshy flats, and by a few cultivated spots. A stream connecting a string of pools and marshes, and called *Sughuchak,* runs through this tract from south-west to north-east (about). The sand-hills nearest to Kok-Rabât are called *Kizil-Kum* ("red sand"), and those nearest to Yârkand are called *Kàrà-kum* ("black sand"). The present road does not pass through Rabàtchi (which I have, however, visited in a shooting excursion). It lies a little distance to the south-west of the spot where the traveller descends into the plains of Yârkand, which extend before him like a garden thickly studded with trees. It is quite correct to say, with our author, that this place in one direction, and Kàrà-Khanâk (or say the modern Suget Bulak) in the other,

With these two descriptions before us, viz. Mirza Haïdar's, written three centuries ago, and that of the present features of the road given in the notes, we see the water distribution which we have to account for. There is one strange thing about it: that streams crossing the road several miles apart are often said by the natives to be one and the same; and on further inquiry one learns that they are derived from a single trunk-stream. Thus the Telbachuk, the Faïzabad, the Kizil Boï, and the Kàràsu, I was told, have one origin, which is said by some to be identical with that of the Kâshghar rivers; and Captain Biddulph, in the interesting account of his visit to Maralbashi (see Royal Geographical Society's 'Proceedings,' vol. xviii.), mentions "three considerable streams flowing from the south," whose names were given to him as "the Derbuchek" (my Telbachuk), "the Chokanah" and "the Faïzabad." He was told "that they are all united into one stream called the Yamânyâr, at no great distance above where I crossed them." Thus it would seem that all the streams crossing the Kâshghar and Yârkand road over a space of, at the least, some 6 miles, beginning from the Fort, are derived from one parent trunk, whose proper name we may conclude to be the *Yamânyâr*, as stated to Captain Biddulph, notwithstanding that my own informants applied the name more particularly to the northern branch.

Similarly the Khân-arik and the several branches of the Tàzghun or Yupurghr are said to be derived from the same origin as the Kusun, the Bésh-kent, and the Saïlik. From the former to the latter the distance is about 20 miles. I am informed that they all issue from the mountains at the same place, and that the water can there be diverted at pleasure from the main river-head into either one or more of the latter, so that one might be made to run dry while the others were full. There is a noted shrine, called after a certain Khoja Paklan, near this spot; and it is said that at the proper season the villagers from below assemble there, and, after prayers, distribute the water into the different channels by means of dams, &c., under the direction of the priests or sheikhs of the shrine, who act as arbiters.

The next river, the Saïghan, is said to rise from springs in

are the limits of the desert region crossed between Kâshghar and Yârkand. His distances are, however, his weak point, as with most Oriental travellers. He probably put them down when he wrote the book in Kashmir (of which he was the ruler) towards the end of his life. With the exception of the first two stages (from Kâshghar to Yangi-Hissâr 6 farsangs) all the distances given in this passage are exaggerated. The tedium of a ride through the desert, and the longing to get it over, would make it seem longer than an equal distance through pleasant country, to one who used no means of measurement beyond his personal impressions.

the plain, though its volume would seem to point to a more distant source in the mountains.

Beyond this, to read Mirza Haïdar's description, one would think that the road led along the banks of the Shàhnâz River, for the stages as far as Kôsh-Gumbaz are said by him to be irrigated by that river. On the contrary, the road runs through a desert, only crossing at intervals strips of cultivation which fringe the few water-courses flowing from the hills on the south-west. But the villagers at the present day have the same story about these being all water of the Shàhnâz, which, they say, is the river which flows in the great valley or opening of the mountains visible to the south-west. Here also the same distribution of water takes place which I have above reported for the Tàzghun and Kusun series of streams. The Shàhnâz water is thus spread over the space from Kilpin to Chumalung, say 13 miles in width.

Thus the natural rivers of the country seem to have disappeared or become merged in the number of artificial water-courses or canals into which they have been distributed by the industry of the children of the soil. And instead of finding the streams diminishing in number and increasing in volume as we follow them downwards, it is the reverse that takes place. There is complexity below and unity above. They resemble arteries rather than veins, though, of course, in the mountains the case is the reverse.

As we leave Kizil and travel towards Kok-Rabât, the secret of this curious state of things begins to reveal itself. The skirts of the mountains are here nearer the road than before, and the desert sloping down from the low outer hills on our right-hand begins to exhibit, on a scale not too large for comprehension, a surface-formation which is common in Tibet, where it can be recognised and studied with greater ease than here. This formation has been most graphically described by Mr. F. Drew, F.G.S., in a paper read before the Geological Society in August, 1873. He has given the name of "alluvial fans" to these deposits of loose material (a sort of convex deltas) brought down through narrow ravines and laid out on the flat land outside their mouths:—"At the mouth of each of these (ravines) are 'alluvial fans' which project out into the flat of the river-alluvium. . . . The radii of the fan are about a mile long; the slope of the ground along these radii (which are each in the direction of the greatest slope) is 5 or 6 degrees. The *fan* is properly a flat cone, having its apex at the mouth of the ravine. In this instance the length of the axis, that is to say, the vertical height of the apex above the alluvial plain, will be about 500 feet, the length of the base of the generating triangle being

about a mile. It will be observed" [from an accompanying illustration] "how very straight is the line of the profile. This is highly characteristic of these fans; and the character is equally marked whatever portion of it we get into view—whatever radius comes into profile. The hard straight line among the irregular outlines of the mountains adds a strange and unlooked-for feature to the landscape. . . . The *radial* lines (seen in Fig. 3) are as faithful representations as I could make of the water-courses with which the surface of the fan is scored. Whether we start from the furthest projecting point of the circumference or edge along the mountains (against which the fan abuts, ending off sharply) to go to the apex at the ravine's mouth, we are always on an equal slope, in this case of 5 or 6 degrees, as before said. In walking across one of the large fans along the path, which is usually made in a curve between the arc and the chord, one is apt to be continually expecting in a few steps to arrive at the summit of the slope; but again and again one is disappointed, new portions of the cone intervening in succession till the central radius is reached.

"The mode of formation of this fan it is not difficult to trace. . . . When the alluvial matter which had been accumulating in the ravine reached past its mouth, there was a tendency of the stream to flow over the material it was bringing down—now in one direction, now in another—in every direction, indeed, from the mouth of the gorge as a centre; and along each line, as it flowed, it accumulated material at an equal angle. Thus cone after cone was formed, each coating the last, and the sloping fan both rose and spread."

I must refer the reader to the rest of this interesting paper for a fuller account of these formations.

With regard to the desert slope in the road from Kizil to Kok-Rabât, I can best characterise it by saying that it consists of a series of fans such as that described by Mr. Drew, only they are on a much larger scale, and (as generally follows) with a gentler inclination. The road rises and sinks in undulations of great width (say 5 or 6 miles from trough to trough). These are the tails of the alluvial fans. The changing horizon-line is always remarkably straight, with a distinct slope downwards from right to left (as one travels south-eastwards). When the traveller approaches the summit of each undulation, another but fainter horizon-line is seen, peeping over that which is immediately before him. This is the central slope of the next fan, several miles off. On looking towards the mountains the profile of the desert is seen defined against the distant hill-side, either as a single slope dipping in the same direction as his own road, or else as a double slope, synclinal if he be in the trough, or anti-

clinal if on the summit of an undulation. The trough, as I have called it, while apparently narrowing as it approaches the hills, widens out often into a small triangular plain *below* the road, as the circumference-curves of the adjacent fans sweep away from it.

These features are on such a large scale (the slope being perhaps 6 or 8 miles in radius) that the eye has a difficulty in taking them in as a whole. But what proves the undulations to be not mere surfaces of sloping parallel cylinders, but low cones—each like a lady's fan spread open, whose axis is propped up (on a reel of cotton, say), so that its surface droops down in every direction from that centre—the proof of this is the distinctly *radial* direction of the water-courses (dry for the most part when I have seen them) which score the ground. As one ascends the slope of each undulation these dry water-courses cross the road, neither at right angles nor parallel to the slope of the horizon, but partly meeting one, as it were, at an obtuse angle. On the other hand, as one descends on the further side, they join the road at an acute angle, inclining towards the direction that one is oneself taking. They all seem to point back towards one source, the apex of the fan or the mouth of its parent ravine.*

Now it is probably this fan-formation and the radial direction of the water-courses caused by it which enables the water issuing from one ravine-mouth to embrace in its branches wide tracts of country. For example, after leaving a certain ruined Chinese post-house, situated in one of the triangular flats between the fan-edges (near the above-mentioned well and rest-house of Ak-langar), one rises up the slope of a fan which is seen to come from a remarkable ravine-cutting in a low range of outer hills to the south-westward. After traversing this fan-undulation for about 7 miles, one reaches the bottom of another trough, marked by a dry water-course which is distinctly seen to come from the same unmistakable cutting, away to the west. So that when the water flows in spring (if it ever does here) the depression in which stands the Chinese Post-house and that near Kok-Rabât (some 7 miles apart) must be supplied with water radiating from one and the same spot.

If we judge by analogy we shall conclude that in the other instances where we see the same result, viz. widely-separated water-courses ascribed to one source or origin, the cause is the same, although we have not yet had the opportunity of verifying

* At the foot of these fan-slopes is a tract of country covered with fine bedded clay, apparently of lacustrine origin. This is very much cut up into irregular hummocks exhibiting the bedded structure; and is partly covered with grassy vegetation, and even small trees and bushes. The road from Topluk to Kôsh-Gumbaz passes along the edge of this broken country, while from Kizil to Kok-Rabât it crosses the tails of the barren alluvial fans.

it by ocular inspection, as in the district between Kizil and Kok-Rabât.* Thus, to begin again from the south, the Shahnâz Valley may be supposed to have produced a gigantic though gently-sloping alluvial fan, which radiates its waters through the various villages from Kilpin to Chamalung. Again, the waters of the Yangi-Hissâr district from the Saïlik to the Kusun River, and possibly the Tàzghun as well, would be radiated by another gigantic fan; for some accounts connect the much greater volume of water of the Tàzghun and Khân-arik with the same system as the Kusun. The case of the Yamân-yâr and Tuman river-systems is more doubtful, for the mountains are here much more distant, and the intervening country is very flat. Hence we seem here to have a kind of inland *delta*, that is, a tract so level as to enable the trunk-river to separate into diverging branches, artificial or natural.

We may perhaps take Mirza Haïdar to be detailing only the natural river-systems, each under the name of its principal branch, and neglecting the artificial and perhaps more modern subdivisions of the water. Even then, in an author usually so careful and accurate, it would be difficult to account for the omission of any representative of the Yamân-yâr or Telbachuk system from his list, unless it be that they are derived from the parent trunk of the Tuman. The considerable stream, called *Saighan* (south of Yangi-Hissâr), is also passed over in silence, whether because he considers it to belong to some other system, or because it does not rise in the mountains. It may be that he includes it in the Shàhnâz system, whose waters may perhaps at one time have filled it (as they are said even now to reach it) before they were diverted to such an extent as they are now, for the irrigation of the villages between Kilpin and Chamalung, which appear to be more numerous than they were in Mirza Haïdar's days.

South of the Shàhnâz there is no other important stream till we get to the Yârkand River. For the village of Kizil seems to monopolise a little rivulet from the lower hills, said to be distinct from the Shàhnâz, being no longer dependent on salt or brackish wells as in former days. Kok-Rabât obtains water by a long cut from the Yârkand River, at the place where it issues from the hills in a district called *Karchung*. This, and its town or large village of the same name, would seem to have supplied the name, if not the locality, of the mysterious *Karchu* of geo-

* This has proved to be true in the case of the far more important fan-delta of the Yarkand River, which, issuing from the mountains below *Karchung*, embraces in its radiating branches the whole cultivation of the Yarkand district, 40 miles in width. See my "Report of an Excursion to the Karchung Valley," in the 'Gazette of India' of October 1875. (R. B. S., March 1877.)

graphers.* It is near *Kusarab* of recent maps (see also Davies' 'Trade Report,' p. cccxx.).

Having thus traced up most of the water which flows through the country between Kâshghar and Yârkand into four or five main trunks, radiating in deltas or fans, we have to discover whence these come. There seems little doubt that the *Kâshghar River* derives its chief supply from the combined Terek and Alaï streams mentioned above. It is doubtful whether the Yamân-yâr system has an independent trunk-stream distinct from that of the Tuman or Kâshghar River. The Chinese author quoted by Colonel Yule † assigns to a river of that name a very important part. After various adventures in the mountains, it is said to enter the Kâshghar frontier and form not only the River Tailibuchuk (Telbachuk), but several others, that is, it is made to be the parent of what I cannot help considering as at least two distinct and unrelated river-systems, or at any rate of parts of them.

The origin of the most southerly of the river-systems detailed above, that of the *Shàhnâz*, seems pretty safely assigned to the great valley or opening in the mountains almost due south of Yangi-Hissâr. By this gorge the Pâmir may be gained, and thence Wakhan and Badakhshân.

There remain then the intermediate system or systems, the *Kusun* and the *Tàzghun*, whose origin we require to ascertain.

Now I have convinced myself since arriving in Kashgharia (as far as one can do so without visiting the spot), that there is a distinct opening in the mountains between the two culminating snow-peaks to the west and south-west of Yangi-Hissâr, which probably approach 20,000 feet in height. The more northerly of these two peaks may be called the *Tàshbalik* (Kirghiz dialect, *Tàshmulak*), from the township of that name near its base. The second is known as the *Tagharma* (Kirgh., *Taghalma*), on the one side, and as the *Uï-tàgh* (house-mountain), from its shape, on the other. It is not often that one gets the opportunity in this hazy climate of distinguishing more than the mere outline against the sky of a line of mountains some 60 miles off. It requires a very clear day to show the details against the face of the mountains. Two or three such opportunities I have lately enjoyed from Kâshghar, how-

* [I still believe, from the history of this name, that it was a mere misrendering of the *Hatchût* of the Chinese surveyors, which really was intended for *Kanjût*.—H. Y.]

† In his Preliminary Essay to Wood's 'Oxus.' This river is said by the Chinese author to issue from Mount Guibuchak (?Kipchak, see also the Mirza's Route, 'Journal Royal Geographical Society,' vol. xli. p. 192), and to flow past a pass called Kàsh-tàshi-ling ("Jade-stone" Turk., and "mountain"? Chin.). But I have not heard of jade being found in this direction.

ever, and the impression which I, as well as others of our party, have received, is that, what in outline appears a mere depression or "col" in the ridge between the two above-mentioned peaks, is in reality an opening through it. In this opening, which leads apparently far in between the mountains, we have a probable origin for one at least of the river-systems whose sources we are looking for.

A Kirghiz acquainted with these mountains informed me the other day that the *Kàrà-kül* (the smaller of the two lakes of that name, of course) lay directly behind them, on a large elevated plain. No water, he says, actually leaves the lake, but if any were to do so (owing to the raising of the surface), it would flow out past the Uïtagh (Taghalma) into the Tashbalik River. This approximate position, and the eastern outflow of the smaller Kàrà-kül agrees with the account given to Colonel Gordon's party. My Kirghiz informant was not able to say which of the rivers of the plain was formed by the Tàshbalik stream.

The mountain belt visible on the west of Kashgharia thus seems to be broken through by several streams flowing with a general west to east direction from the high plateau behind it. We have first the Oksaldi opening (from the Alaï); perhaps another at Bori-Tokaï; then the Tàshbalik opening; then that of the Shàhnâz, south of Yangi-Hissâr. These seem to be divided from one another by a series of gigantic ridges, whose eastern extremities and spurs, coalescing together to the view from the effect of perspective, give an appearance of continuity to the mass. This is a very common experience in mountain exploration, and several times it has happened to me to walk through what, to all appearance, was a serried mountain-range barring my path; and to find it really consist of several ridges running at right angles to the apparent axis of the mass, whose seeming continuity was a mere optical illusion. I think we should consider the mountains on the east of the Pâmir plateau, not as a range lying roughly north and south, and cut through by the rivers (as is the case with the continuation of the Mustak Range south of Karakoram), but rather as a series of more or less parallel ridges whose direction is roughly east and west, and between which the eastward drainage of the Pâmir plateau escapes. It is probable that we could trace some of these ridges right on to and even across the table-land at their back, where their axes would form the separation between the several Pâmirs. This would be in harmony not only with the lie of the ridges bounding the Alaï (seen by Fedschenko), but also with those traced by Colonel Gordon's party on the north of Kâshghar, where the southward flow of the streams does not prevent the ridges from running east and west; or,

as Dr. Stoliczka expressed it, "the system of drainage has no essential effect upon the direction of the hill-ranges. This, dating from much older times, was mainly an east-westerly one, following the strike of the rocks which compose the whole mountain-system."*

A somewhat corresponding account is given by Colonel Gordon's party of the Southern Pâmir region, adjoining the district in question. Captain Biddulph writes: "The Pâmir, instead of being a steppe which you can march across in every direction, consists, as far as we can make out, of a series of broad valleys at a great elevation, called by the names of the different Pâmirs, along which the different roads run" (between Eastern and Western Turkistan and Badakhshàn). "The whole way from Aktash to Sarhad, four days' march, we were in one broad valley, there being no perceptible rise between the lake (Pâmir Kul) and the commencement of the waters flowing west."† The forthcoming report by Captain Trotter, R.E., on the exploration of the Southern Pâmir, may be expected to clear away all remaining difficulties on this subject.

It is across this Pâmir region that Mirza Haïdar's next gauge-line leads, viz. that from Yârkand to Badakhshân (to which we may now return after this long digression). In speaking of "seven or eight days' journey," he expressly refers to Pâmir itself, viz. the country *on* the mountains, and excludes the defiles and valleys by which it is approached, which extend over a much longer distance.

We may now give a glance at *Balor*, which is here mentioned in passing as being conterminous with the Yârkand provinces of Raskam and Tâghdumbâsh in the region which succeeds Pâmir, as one follows round the mountain-curve. The name is distinctly spelt *Balor* (بلور), in my copy, and not *Ma*laur (ملور), as seems to be the case in some other MSS. The dot under the *b* would easily slip out in transcription, and leave the semblance of an *m*. After Balor comes Tibet, ac-

* 'Records of the Geological Survey of India,' No. 3, 1874, p. 85.

† I may here quote a passage from a paper read by me before the Geological Section of the British Association at Brighton in August 1872: "My idea then of the Pâmir is that, instead of a *meridional* range, there is a series of *latitudinal* ribs or ridges running east and west. The spaces between these are occupied by high plateaux dotted with lakes, whence issue various streams flowing some east and some west, and which, as they leave behind them the central plateaux, cut their way gradually into deeper and deeper gorges to reach the plains. . . If I am right in my conclusions, there is no one Pâmir plain, but several separate ones divided off by the more or less elevated mountain ridges, which run across from east to west. . . . It is probable that everything in this district deserving the name of a ridge or range of mountains has its axis directed not far from east and west, and that the great Eastern and Western systems of drainage originate near together on the high intervening plateaux, on which the waters divide almost as the drops of rain on a duck's back, some trickling down to the right and some to the left."

cording to our author. Now, the farthest province of Tibet in this direction, as described by him, is *Balti.**

We thus get an exact description of the North-Eastern boundary of Balor. For what adjoins Tâghdumbâsh and Raskam and Balti towards the south and west respectively, is the country now called Kanjut (Hunza and Nagar).

In another passage he tells us: "The Eastern border of *Balor*istân adjoins the country of Kâshghar and Yârkand" (viz. the provinces of Tâghdumbâsh and Raskam above-mentioned), "its Northern border adjoins Badakhshân, its Western, Kâbul and Lumghan (Laghman), and its Southern border is the country of Kashmir."†

Balor, therefore, included the present districts of Kafiristân, Chitrâl, Yassîn, Gilgit, Hunza-Nagar, &c. Probably, it also extended south of the Indus to Astor and Chilâs. Wakhân is excluded, being considered part of Badakshân, since Mirza Haïdar says: "I *returned* from Balor to Sarigh Juyân (Chaupân, جوبان for چوپان), which is at the head of Wakhân. There is a common tie between all the districts thus indicated, in that they constitute the habitation of the *Dard* race.

According to Mirza Haïdar's definition, therefore (and he was in a good position to judge, having conquered the country), Balor anwered to *Dardistân.* Colonel Yule has already shown, from a comparison of authorities, that this is where we must look for it.‡

We now come to the route from Yârkand to Kashmir. Starting *viâ* Sanju he makes it traverse Baltistân. Had he taken it *viâ* Kugiâr and the Muztak Pass, the distance across the mountains would have been nearer what he says, viz. 20 days' march. But going *viâ* Sanju proper, it would be considerably more, unless for a lightly-equipped horseman travelling at speed. Moreover, Iskardo (Baltistân) is not on the road from *Sanju* to Kashmir, while it does lie on the Muztak Pass route. We may therefore suppose that to be the route which Mirza Haïdar had in his mind, if we allow that he has extended the name *Sanju* to the more westerly part of the same Kuen-Lun Range (the portion now called "Yangi-Dawân"). For as I have before pointed out, it is probable that the lines which he gives are the routes travelled by himself or his informants. In the

* In another place he writes: "Balti is one of the provinces of Tibet, and it (viz. Tibet) comprehends several other provinces, such as Purik, Khapulah, and Ishgar (Shigar), and Iskardo and Ladaks." (This is the correct spelling.)

† This might perhaps be read, "Swat and Kashmir," the words being سوا و کشمیر; but I think the above translation is more correct.

‡ See also Vigne's 'Travels,' vol. ii. p. 309.

absence of maps, he is not likely to have described the course of an imaginary straight line drawn from point to point.

But we know that he also traversed in person the Karakoram Route, though whether by precisely the same line as is now in use seems uncertain. And here I must mention a feature which I noticed in my last journey, having missed it before.

The valley by which one approaches the Karakoram Pass from the south side is a broad open one, bordered by comparatively low ridges on either hand which are arranged as it were *en échelon*. After ascending very gradually for some 12 miles from Daulat-Beg Uldi (the last camp), rising only some 800 feet in that distance, the road leaves the valley and turns up the hill-side on the right, and after a short ascent (of some 700 feet) crosses a low neck into other equally gently-sloping open valleys leading north. This is the Karakoram Pass.* There is no snow near it, and the neighbouring ridges are only 100 or 200 feet higher than it. But while resting on the southern ascent above mentioned, I noticed that the broad Daulat Beg Valley culminates a mile or two beyond where we had left it, and rises no longer. On the contrary, after seeming to continue at the same level for a short distance, it begins to slope distinctly downwards and away from us towards some snow-mountains on the north-west. Further it seems to turn *northwards* under these mountains (disappearing from the sight), and the caravan-men reported that it joins the Yârkand River at *Kufalung*. The following was my note, written on the spot:—"It seems certain that it cannot turn *southwards* and join the Shayok, for a careful distant scrutiny reveals no opening in the wall of mountain which forms its south-west side, and which appears to join on to the mass of snowy mountain which bears from 293° to 300° (about)."

This appearance might be deceptive, but there remains the fact that all the head-waters of the Shayok, south of this, as well as of the Nubra River, come out of vast glaciers amongst gigantic mountains; and it is almost impossible to conceive that a higher source should exist, whose water would have to enter one of these glaciers at its head and flow out under it.† The

* If one attempted to give an idea of the gradients by a section drawn to scale, in which the lowest points of the country lying between the Karakoram and the ranges north and south of it respectively, should be represented as 6 inches apart; the height of the Karakoram above the straight line which joins them would be rather less than one-twentieth of an inch, or as much as the thickness of two good strokes of a soft pencil. The actual figures are: Daulat-beg (about) 16,652 feet; Malikshah (about) 15,140 feet; Karakoram (about) 18,172 feet. The two camps here mentioned are about 45 miles apart, and on either side of them the ground rises again.

† Moreover, the drainage of the space between this and the Shayok Glaciers seems to be accounted for as follows: At a place called *Balti Polo*, some two

native report of the junction of this valley from the southern side of the Karakoram, with the Yârkand River at Kufalung, seems less liable to objection, and agrees better with other circumstances. Strangely enough, we have a report to the same effect, given by Vigne: "The Kurukurum Mountains I believe to be a branch or spur from the Muztak. . . . The appellation appears to be applied to a crest at the summit, 500 feet high, *which can, however, be avoided by a circuit of a few miles.*" * The easiness of the ascent of the small rise constituting the pass, and the importance of avoiding any prolonged stay in this rarefied atmosphere (which forms the real difficulty of the Karakoram), accounts for the fact of the short cut over the "col" being used by caravans instead of the *détour* by the almost equally elevated valley.

But if the above conclusions be correct, it is evident that the so-called Karakoram *Range* has no *locus standi* left. It has before been shown that further *east*, the water-parting represented by that name on the maps is not even a ridge, but that many of the streams running into the Indus on one side, and into the Turkistân rivers on the other, originate close together on open (though elevated) plains.† But now it would seem that even directly *west* of the Karakoram Pass we may ride across on a level from sources that feed the Indus into others which join the Yârkand River. The little ridge of

miles above Daulat-Beg, a considerable stream (larger than that from the main valley) comes in from the west. I hear from several independent witnesses that there is a way, by following up this river, of reaching Baltistân, over a difficult Glacier Pass. Two days above (west of) Balti Polo, the foot of the glacier is reached. Horses have to be turned back from this point, and coolies come from Baltistàn to fetch the loads, on the rare occasions when this route is used. After crossing a high glacier pass (to the east of the Muztak Pass) the traveller descends upon *Tsaltoro*, and thence to *Kapalu* in Baltistân. From Polo to Kapalu takes about ten days. Vigne seems to have made an attempt to traverse this route. See his 'Travels,' vol. ii. pp. 382–3. This line, therefore, running west from Daulat Beg would seem to cut off any retreat southwards for the valley which runs in a direction north west from the same point. And, as a corollary, if anything were wanting to show how erroneous is the identification of the Muztak Range with a so-called Karakoram Range, it would be this fact: that a road leading from Baltistân across a high glacier pass of the Muztak Range, on reaching the northern side of that pass still finds itself *south* of Karakoram. The truth is, that while the Muztak Range coincides with the water-parting between the Indus and Yârkand rivers as far east as the seventy-seventh degree of longitude (about), from that point eastward the range and the water-parting are divorced; the former continues its previous direction with its mighty snow-peaks and glaciers, running across the head-waters of the Shayok, which pierce it through narrow, often almost tunnel-like, gorges; while the latter (the water-parting) turns off to the north-east across the high Karakoram plateau, winding about among the hills which stud its surface, sometimes coinciding for a short distance with a ridge, and forming an imaginary line across the elevated plains.

* See Vigne's 'Travels in Kashmir,' &c., vol. ii. p. 361. Ed. 1844.

† See opposite page 77 of Henderson's 'Lahore to Yarkand' for a photograph view of a part of these plains. It will be observed that there is quite a sea-horizon.

Karakoram, therefore, is cut off on both sides, and has no physical connection with the mighty Muztak Range and its peaks of 28,000 feet of elevation,* on which it has wrongly imposed its name in European maps, though never in the minds or speech of the natives.

It may perhaps be urged in reply (as it has been before) that this is a mere question of names. But I venture to think that, unless it be considered that the difference between a *range* and a *plateau* is unimportant, it is best to keep its own proper name for each. The fact that river-basins are often divided from one another by ranges (or long masses of mountain raised steeply above the surrounding level) is no good reason why we should give that name to a water-parting which is *not* so formed. If it be, then we must be prepared to find *ranges* starting up all over England.

By talking of the Karakoram Range, moreover, a false idea of the natural features of the country is fostered. For instance, in the recent discussions concerning the plan for a railway from India to Central Asia, the necessity for a tunnel through the Karakoram Range was mentioned as one of the obstacles. Nothing of the kind would be required; and a line could in many places be run across the water-parting itself, with no steeper gradient than is often to be met with on European railways. It is almost needless to add that the real obstacles to such a scheme (taking into consideration only physical difficulties) occur elsewhere, and are of a different sort—probably far more fatal.

Mirza Haïdar does not seem to have considered that he crossed a range here, for he writes (in the account of his journey back from Ladâk): "The air was bitterly cold, for (the Sun) was in the mansion of Virgo. We arrived at a place † called Karakoram at sunset. There is a large stream; it was all frozen. Wherever we broke it, there was not a drop of water. Our cattle had travelled all day, through a district where the breath is caught,‡ a waterless march. . . . Jân Ahmad said: 'I once saw a spring of water (here); we must go nearly half a *farsang* (further).' He showed us the place in the middle of the ice, where we should make a hole. When they had broken (the ice), there was water, and they gave the cattle to drink. . . . Through such hardships we reached the place (written *Taghatak; ?* Aktagh or Taghalik) where the unknown road leading to Badakhshân separates off."

* In the Karakoram Ridge, and near the line of the water-parting, which is east of the great sources of the Shayok, I have seen no peak more than 2000 feet higher than the pass, or say 3000 feet above the general level of the plateau.

† موضع ‡ That is, when the breathing is affected by the rarity of the air.

His next gauge-line is that from Khotan to Lahore, *viâ* Rudok, Gugé, and Spiti. Supposing, as before, that this represents an actual road, he must have known of the route (often noticed lately) leading *viâ* Kiria and Pulu (in *Khotan*) to *Rudok* (in Tibet, near the Pangong Lake), and thence by a road closed to Europeans through a corner of the Chinese province of *Gugé* (Chumurti), probably over the Budpo Là (Pass) and down the Pàra River into *Spiti* (a British district), and so through Kulu by *Sultànpur*, on the River Biâs, to Kàngra and Lahore.

To complete Mirza Haïdar's account of the geography of Eastern Turkistan, I will quote his description of the Eastern termination of the great mountain-mass which he has traced round in its grand sweep from the north, by the west and south of Kashgaria.

"The land of Tibet," viz. the southern arm of the great mass, "is a highland. . . . Its point of departure on the north-west adjoins Balor, the position of which has been already mentioned. It extends on the south-east to Sàlâr * itself, which is among the dependencies of Khatâyan (Chinese) *Kanjan-fu.*† . . . On the north and east of Tibet are Yârkand, Khotan, Charchan, Lob, Kank,‡ and Sarigh-Aïghur, and beyond this is sand, whose further boundary reaches to *Kanju* and *Sakju* § of Khataï (China). . . . All waters which flow from the mountains of Tibet towards the east and north, form the river of Yârkand and the River Ak-kash, and the rivers of Kiria and Charchan, and the rest. They flow into *Kok-naur* ‖ (Koko Nor). Koknaur is a lake in the sandy desert which has been mentioned. I hear from several Moghuls, who have seen it, that one can go round it for three months, and (that) a large river comes out of its lower extremity,‖ which is called the Kàrà-turan ¶ of Khataï (China)."

* * * * *

* *Sàlâr* is identified by Colonel Yule with Ho-chau. It is described to me as a mountain district, the stronghold of the rebel Tungânis, who, up till lately at any rate, held it against the Manchus. This is much beyond the present limits of Tibet, but Marco Polo also gives Tibet a great easterly extension. See Yule's 'Marco Polo,' vol. ii. p. 29. 1st Ed. (I now find that Sàlâr is a hill-district on the southern bank of the Yellow River (Hoang-Ho) a couple of marches west of Ho-chau and the home of a tribe of Turkish extraction, allies of the Tungànis. R. B. S., 1877.)

† *Kanjan-fu* is identified by Colonel Yule with the important city of Singan-fu. [It is interesting to find this *Polonian* name of Singanfu still used by Mirza Haidar in the sixteenth century. His mention of *Charch'an* between Khotan and Lob is another most interesting illustration of Polo.—H. Y.]

‡ *Kank*, of which I cannot get any modern account, seems to Sir H. Rawlinson to be possibly connected with the Perso-Aryan Kang-diz myth. I may add that the same idea at once struck an educated native of the Panjàb, to whom I showed the passage from Mirza Haïdar.

§ *Kanju* is Marco Polo's Campichu; and *Sakju* is Suhchau [Yule].

‖ These seem to be popular misconceptions. See also Vigne's 'Travels, vol. ii. p. 369.

¶ *Kàrà-turan* for *Kàrà-muran*; the Hoang-Ho.

Since writing the above I have come across Severtsoff's paper in the 'Royal Geographical Society's Journal' for 1870. The following passages corroborate some of the views taken by me:—

"The Bolor * is not a distinct meridional range, but merely a north-western continuation of the Himalayas, or more correctly, of the Himalayan branch of the Tsun-lin, which is a gigantic convexity, connecting, by means of gradual transitions, the system of the Thian-Shan with that of the Himalayas" (p. 392, note). . . . "The real orographical import of my observations on the mountains between the Chu and the Syr Daria lies in . . . the confirmation of the ideas of Huen Tsan and of the Chinese generally, concerning them (the Tsun-lin Mountains), viz. that they are . . . an extensive mountain region, formed by the meeting and blending of the two distinct and colossal systems, those of the Thian-Shan and of the Himalayas. The Kuen-Lun and Bolor,* as we have seen, do not form separate ranges, but both belong to the Himalayan system. . . . The Thian-Shan and the Himalayan systems respectively represent a wide and continuous convexity, upon which rise numerous ranges subsidiary to the general convexity, and consequently of secondary orographical importance. . . . The Altaï also presents the appearance of a wide protuberance, studded with numerous ridges" (pp. 399, 400).

To this very clear view of the matter I should be inclined to add, that the "gradual transition" between the Thian Shan and the Himalayan system, spoken of above by M. Severtsoff, is effected in a different manner for the *ridges* and for the *water-parting* respectively. The *former*, being the result of vast upheavals of earlier date than the present drainage-system, retain, even where broken up into short lengths, their own directions, which are generally intermediate between those of the two mountain-systems to which they are more or less subordinate. They are like splinters lying between two ends of a divided trunk, whose other extremities have been dragged asunder. While the *water-parting*, which begins by coinciding in direction with the axis of the Himalayan system (running about south-east to north-west) and ends by going from south-west to north-east (about) with the Thian-Shan system, sweeps round in a wide curve from the one to the other, its general direction cutting the said splinter-ridges at all angles in its course, it being, in fact, a mere imaginary line joining the culminating portions of the intervening plateaux. Its manner of transition is like that of a willow-wand which is bent almost double without breaking.

* The name given to a supposed range in the place actually occupied by the mountainous plateaux of Pâmir.

X.—*On the District of Akém, in West Africa.* By Captain J. S. Hay.

[*Read*, June 26th, 1876.]

During the late war between the Asàntis and Djaubins in the latter part of 1875, I received orders from the Governor of the Gold Coast to take command of the field force sent up to the frontier of the British Protectorate, to prevent the neutrality of our territory being violated by the Asàntis, the Djaubins having been driven to take shelter in our territory of Akém. Starting from Accra on the 17th November, I reached Kyebi, the capital of Akém, after 5 days' heavy march, having walked 150 miles chiefly through mud and water, on the 21st; and here, during a period of three months, I had occasion to make my head-quarters. Having thus had ample opportunity to make myself acquainted with an interesting district hitherto almost unknown and unexplored, I have undertaken to describe, as clearly and briefly as possible, what I was able to observe during my stay.

For the sake of greater clearness, I shall divide my remarks into three heads, under which the various particulars I collected seem most naturally to group themselves: 1. The geographical situation, the size and relative position of the towns and villages, with the distances between them, and the course of its rivers. 2. The characteristics of its soil, its timber-woods, mineral and vegetable produce, and peculiarities of climate and scenery. 3. The personal appearance, habits, manners, religion, and language of the natives.

The district of Akém in West Africa lies between 6° and 7° N. lat., in about 1° W. long. It is bounded on the north by the Okwaoo and Karaki countries; on the east by the districts of Krobo and Aquapem; on the south by Gabene and Fàntéland; and on the west by Asànti. A series of mountain-ranges, densely covered with primeval forests, occupy the whole extent, except a small portion of the south-east and a still smaller portion of the western part. The towns and villages are mostly situated on or near the tops of the hills; the exceptions being Akakam, Tumfah, Asuom, Abomosso, Asunafoo, Akrofu, Mmoso, Quabin, and Anninam, lying in that limited western portion where the country is flat. In the larger level district of the south-east are only two small towns, viz., Osanease and Asâmang, the remainder of that portion, with the exception of a few sparsely scattered hunters' huts, being totally uninhabited.

The following tabulated list of the chief towns and villages,

with the average length of journey between them during the *dry season*, may be useful for reference.

	Hours.		Hours.
Ahabante to Kukurantumi ..	12	Dasawasse to Anninam	3
Kukurantumi to Kyebi	8	Anninam to Quabin	2½
——— to Fankyeneko ..	8	Quabin to Mmoso	1½
Kyebi to Tumfah	5	Dwenase to Fankyeneko	4
—— to Asiakwa	4	Dasawasse to Asiakwa	4
—— to Akuropong	3	Mmoso to Assahmama	2
Tumfah to Asuom	6	Assahmama to Asunafoo	2
Asiakwa to Fankyeneko	4	Akuropong to Tekimang	2½
Fankyeneko to Begoro	3	Tekimang to Apinamang	3
Abomosso to Tumfah	4	Apinamang to Akanteng	4½
——— to Asunafoo	1	Akanteng to Osanease	3½
Abompe to Dasawasse	1½	Osanease to Asâmang	6
——— to Dwenase	½	Akrofu to Quabin	1

Having described one of these towns I shall have described all, as they scarcely vary at all in appearance. As one wends one's way through the trackless forest, no outskirts or other sign mark the approach to a scene of human life and habitation. We come upon them all at once, without the slightest notice or indication. They are hidden from sight by the primeval trees until they are actually reached. They generally consist of one long straggling street; the houses are constructed of bamboo framework, held together by wood-fibre and thatched with palm and plantain-leaf. The side-walls are plastered with mud over the framework, and very rarely have windows or apertures. They are entered by a side-door, leading into a courtyard, where the culinary operations, such as they are, are performed; the rooms, which are very small and low, being distributed on three sides of the courtyard. In the centre of the town there is generally a fetish-tree, supposed to be inhabited by the local deities, and two trees, one at each end, with rude benches or logs of wood at their feet, where the kings and chiefs hold their "palavers" and receptions.

The whole country is well watered, the principal rivers being: 1, the Berem; 2, the Densu; 3, the Bompong; 4, the Pompong. The channels of these rivers are never dry, receiving constantly a supply of water from the mountain-ranges, and being also frequently swollen by rain. 1. The Berem, though not the widest, is the longest in its course. It rises in the hills near the little village of Apapam, and flowing past Kyebi, the capital, runs north as far as Nsutam, where it changes its course to west, and flowing through the west and south-west part of the country, joins the Prah, on the borders of Akém and Asànti. 2. The Densu (in the latter part of its course known as the Sakoum) also rises in the neighbourhood of Apapam, and, watering the south-east part of the district, falls into the sea Sakumo. 3. The

Bompong and Pompong both rise in the neighbourhood of the two small villages of Osem and Tafo. The Bompong flows south and joins the Densu. 4. The Pompong flows north-east, and falls into the Afram. These rivers, owing to the presence of numerous small waterfalls and shoals, would only be navigable by light canoes, though these even are not used by the natives, who have no commerce, and are too indolent to create any.

Having thus described the leading features of the geographical position of Akém, I now come to the second part of the subject, viz., the characteristics of its soil, its timber-woods, mineral and vegetable produce, and peculiarities of climate.

The entire country of Akém is auriferous in a high degree; the natives, however, are too ignorant and too lazy to work the gold properly, and content themselves with digging circular holes from 16 to 20 feet deep to obtain it, in the shape of small nuggets and dust, the latter being also found in the rivers and watercourses, where I have myself seen them washing it. The country is honeycombed in some parts with these gold holes, which makes walking a difficult and sometimes dangerous operation. The soil is a heavy tenacious red clay, quartz strata and red sandstone cropping up in every direction. The country is rich in timber-woods, which grow to immense height and girth—some I have myself seen over 100 feet high. The largest and best are: 1, the Odum; 2, the Aboko; 3, the Bompaga; 4, the Okusia; and 5, the Osuberene. These are heavy red close-grained woods, that work up well. 1, the Ofram; 2, the Awamemma; 3, the Osia; 4, the Osese; and 5, the Cotton-tree, are white woods, and, with the exception of the last named, which is too soft for working, are available for the same purpose. This wood would be a very valuable article of merchandise could it be transported to the coast, but in the present lack of roads, and of all means of transport, combined with the utter want of industry among the natives, it is a source of wealth that is not appreciated at all, except in the case of the cotton-tree, which is used by the natives nearer the coast for the construction of canoes. The forests being thus left in their primeval state, all cultivation is rendered impossible. With a very small amount of activity and intelligence, however, were the forests cleared in the neighbourhood of the towns, the soil is so rich as to be capable of growing cotton, rice, ginger, and coffee (not to speak of other products), in any quantity. As it is, in spite of the sloth of the natives, the palm-tree flourishes luxuriantly, and were it cultivated in plantations, the oil would prove a rich staple of commerce with the coast. The tobacco-plant grows wild in rank luxuriance, untended and unused, the natives purchasing from the coast for their own con-

sumption supplies of the prepared leaf sent from America. The chief fruits, all growing wild, are the guava, the papaw, the plantain, the mango, and the pine-apple. All these, except the guava, which I only saw in the neighbourhood of Kyebi, grow in inexhaustible profusion.

In the neighbourhood of Begoro, the most northerly town in the district, are innumerable gum-trees and india-rubbers; and both might prove a fertile source of wealth, had the natives enough human intelligence and industry to avail themselves of the treasures which Nature showers upon them with so lavish a hand.

In the forests there is an almost total absence of animal life. There are a few deer, leopards, and monkeys, which, at least to a European, are inaccessible, owing to the density of their haunts. I never saw any myself in a live state during my whole stay there; and once only I tasted some venison, which had been shot by a native in the neighbourhood of Kyebi.

The climate of Akém is throughout the year humid. During the three months of my stay there (from November to Jauuary), in what by comparison is called the dry season, no day passed without rain, which generally commenced in the afternoon, accompanied by heavy thunder and lightning.

In the rainy season fever is prevalent. The natives are also subject to epidemics of small-pox, which sometimes carries off nearly the whole population of a town or village,—a visitation aggravated by the ignorant horror they display of vaccination. Leprosy also prevails, and sometimes carries off the whole of their hands and feet, and they are very subject to guinea-worm and ulcers. The goitre is also a prevalent complaint in the south of the district.

A few words may be added about the forest scenery. The palm-trees covered with flowering creepers and ferns, the latter offering varieties unknown in this country, but which, being no botanist, I shall not attempt to describe; the cotton and other trees covered with ivy, the branches interlaced in grotesque and serpent-like forms, and

"The lustre of the long convolvuluses,"

such as Enoch Arden saw them in his desolate island, combined with a death-like silence, only broken occasionally by the fall of a bough, or the melancholy cry of a bird, make up a picture not often seen. It is difficult to convey an idea of the density of these forests to anyone who has not gone through them. The work of doing so is extremely difficult. Sometimes the bush and undergrowth are so thick, that even what track there is, is lost; and occasionally the traveller comes to a veritable swamp,

and can only proceed by walking for hours through water and mud, with the annoyance of the indescribable stench of the decayed vegetable matter and gases rising from the mud.

I come now to the third and concluding section of my subject, viz., the personal appearance, habits, manners, language, and religion of the natives. The men are generally of medium height, and the women well formed, but short, of lighter colour than the coast-tribes, with less of the negro type. The males are of slight build, but capable of undergoing great fatigue when they choose; but they are so incorrigibly idle and so addicted to drunkenness, whenever they obtain rum in sufficient quantities, that they, for the most part, leave all the work to the women, who forage for their food, collect branches for fuel, and wash the gold from the streams. Amongst the men I have frequently noticed an extraordinary growth of the cheek-bones under the eyes. These take the form of horns on each side of the nose, and so long do they become, that I have seen instances in which the man had to squint violently in order to see at all. The growth begins in childhood. The skin is not broken in any way, but seems to stretch over the horns like a glove. This phenomenon is, I believe, peculiar to the tribe, having noticed it in no other.

Food.—They are very partial to palm-oil (which, however, they can rarely obtain, as they are too idle to cultivate it), taking it in the form of soup, with snails or monkey's flesh. Their ordinary dish is called "Fou-fou," and consists of green plantains, boiled and beaten to a pulp by a bough in the hollow of a cotton-tree, a little cold water being mixed with them. Of this they consume enormous quantities, after which they frequently fast for twenty-four hours. They sometimes *roast* the plantains over a wood fire.

Marriage Customs.—These are curious and interesting. They are, of course, polygamists, and a man is counted rich in proportion to the number of his wives. Instead of receiving a dowry from the family of the bride, the candidate pays a price to the father, varying from 5*l.* to 10*l.* in gold-dust, besides, "dashes" of cloth and rum. The only exception to this rule is the reigning chief of the district, who has the power to demand the daughter of any man without the customary payment. The present King of Eastern Akém has about thirty; but some of these are well-stricken in years, it being the custom when the King ascends the "stool" for him to retain the principal wives of his predecessor. The present King, who, in accordance with the line of succession, succeeded his uncle, has a number of the late king's wives in the harem. A daughter of the royal family in all the tribes can propose to any man, and he cannot refuse

to accept her, generally on pain of death. When a princess chooses a peasant, which is sometimes the case, the latter is at once made a chief. He is, like the rest, allowed to take other wives; but if the princess conceives any dislike to any of them, she has merely to order him to send them away, and he is compelled on pain of death to obey. They have also the privilege of divorcing their husbands without appearing before any tribunal, presenting them simply with a piece of white clay, as a token of dismissal. The common people have to appear before the chiefs, and get the case settled by them. If they grant the divorce to the woman, her family retain her dowry, and the chiefs present her with a piece of white clay, with which she marks all the trees in the principal street, to show she is no longer a wife. If they grant it to the man, the wife's dowry has to be returned by the family.

With the exception of the few who are engaged in hunting, and who stay out for a week or more in the forests on the bare chance of shooting a leopard or deer, the large bulk of the male population follow no regular occupation, but dawdle or sleep about the towns and villages, while the women are at work. They retire within doors at dark, which occurs at much the same period throughout the year. They have a great dread of going out again after dark, and if the King in his rambles with his officers, when he goes out to see that everything is right, catches any of them abroad, they receive a flogging, as it is assumed they cannot be out for any good purpose, and the evil spirits of the night are supposed to be abroad.

In their *Burial Customs*, which otherwise much resemble those of an Irish "wake," they differ only in this respect from the tribes on the coast—that they have burial-grounds outside their towns, instead of burying the dead in their houses. When a person dies, the relatives streak themselves with red earth, and the assembled friends proceed to howl and shriek in the house and through the streets in the most fearful manner. The corpse is dressed in the best clothes, food being placed near it, and portions of jewellery and cloth are buried with it.

Religion.—The following are some of the principal features of their religion, as obligingly communicated to me in writing by the Rev. David Asante, the native missionary. The idea generally prevalent among Europeans respecting the fetishism of the people of the Gold Coast is an entirely erroneous one. Their religion is popularly supposed to consist merely in the worship of pieces of wood and stone. They are assumed to know nothing at all about an overruling God and Creator. All this is very wide of the actual fact. They have, it is true, a multiplicity of deities, although their worship even of these

differs very essentially from the common notions current about it, as will be presently shown. But long before the Christian doctrine was brought to their country they entertained a clear and remarkably-developed idea of the one supreme God, whom they hold to be the Creator and Preserver of all things, who is omnipresent in the visible firmament, which they consider as a part of His immense and boundless being. He is all-knowing, all-seeing, and all-hearing, but invisible to man in His personal form. Being without either birth or death, He is neither old nor young. He is the Father, and earth the mother of the universe. If He kills, nobody can save; if He saves, nobody can kill. He determines unchangeably and irrevocably the fate of every individual before his birth; hence the proverb or adage of the Chwẹe people, "Fate is an unchangeable determination." They call him *Anyankôpong*, a name never given to any of the minor deities, nor pronounced in the plural form. Him they hold to be not only the Creator of all inanimate things, but also of the invisible spirits in the air, who, as He dwells too far from man himself, are the medium of communication between God and man, the punishers of evil, and the rewarders of good deeds. These spirits are of three kinds or orders, two being personal, and a third impersonal, but, nevertheless, possessed with a certain power to effect good or evil in answer to prayer. Of this third or impersonal order are the amulets worn on neck, leg, or hand, and set up in houses. The minor fetishes or spirits who form the second order, apparently created in imitation or derived from the elder one of the original great fetishes, have their abode chiefly in Odum or cotton-trees, and sometimes in a wooden bowl or brass pan, filled up with a mass of clay and leaves. These minor fetishes have priests who act as their interpreters, make known their will to man, and dance publicly before the populace. They also are revered as soothsayers, and to them the people resort for advice in cases of sickness and misfortune. In the former they are especially useful, for, possessing generally a pretty good knowledge of herbal effects, they act as the chief doctors in each village. When any one is chosen by one of the minor fetishes as his priest or priestess, the person jumps about as if mad or possessed, abstaining from food and drink, and even from speech, till the name of the fetish is found out by an elder priest. The minor fetish being discovered, receives local habitation by being placed into a bowl or brass pan, whereupon sacrifices are brought to it. The newly-appointed priest is then given in charge of an elder one, with whom he stays for three years to receive instruction in his office. They are always chosen young, and during the period of tuition are not allowed to marry. They

are bound to remain unshaven for the rest of their lives. This priesthood is not hereditary. When a priest or priestess dies, the fetish whom they served may select a new one to succeed them from any family except that of the king. The ordinary sacrifices offered to the minor fetishes consist of sheep, goats, dogs, fowls, yams, and drink-offerings of all kinds. Besides the great annual feasts, these sacrifices are made on certain days of every week, or as often as the people bring them. The first order, viz., the great fetishes or spirits, seem, however, in all probability, to have been the original deities of the Chwee people, or people of the Gold Coast. They are not worshipped in images, nor confined in bowls or brass pans, like the minor fetishes or spirits, nor are they even supposed to take up either a permanent or temporary abode in trees, but are believed to dwell in rocks, caverns, groves, and other wild and romantic places. They are accredited, to a certain degree, with the same qualities as the great God or Creator. They are invisible even to their priests, being seen only on the rare occasions when they appear to terrify some evil-disposed person to death, or to avenge in kind some cruelty a mortal has attempted to commit on them, unwitting who they were. Otherwise they marry, beget children, and do almost everything that human beings do. These great fetishes do not choose their priests from among the people as the minor fetishes do. Their priesthood is a separate order, and is hereditary, being of much the same nature and character as that of the priesthood of the Old Covenant. They neither dance publicly nor act as soothsayers, like the priests of the minor fetishes. They are consecrated on succeeding to their office by an elder priest in the presence of others. A sacrifice is brought to the great fetish whose priest is thus newly called, and the consecrating priest offers with it a prayer to the following effect, invoking the fetish in question by his name, and naming also his new minister:—"God Earth Great Fetish ——, I now consecrate thy son —— to be thy priest. Grant unto him a large family and much wealth. Protect him and them from all evil. Bless his friends and well-wishers, and curse his enemies that wish him evil. Give him eloquence in offering his prayers in all sacrifices," &c., &c.

The chief duty of these priests is to bring sacrifices on certain days of the week to their respective great fetishes, and to accompany each with the appropriate prayers appointed for the occasion, in which they have to be thoroughly conversant. Their usual sacrifices consist of bullocks, sheep, goats, and palm-wine. The beasts thus offered must be without blemish or spot, and, if they are females, must not be in a state of pregnancy. There are places of sacrifice in the dwellings or

courtyards of the priests, where they offer only drink offerings; but other offerings, which are always connected with drink offerings, are brought to the respective localities or habitations of the fetishes. These places are never approached, not even by the priests, without a sacrifice, which is offered on an altar of unhewn stones. On the day of offering, the priest is to abstain from woman and from all animal food. Should he happen to touch either, whether wittingly or unwittingly, he is polluted and rendered unfit to offer a sacrifice on that day. These priests are not allowed to marry a widow, and are strictly prohibited to touch a dead body. After attending the funeral custom of a friend or relative, a priest must be sanctified in the evening with consecrated water, to be sprinkled over him three times by himself or by another priest of his order. He is also exempted from fasting, even on the death of his nearest relative. These priests are classified according to the importance of their respective great fetishes, and do not all enjoy the same privileges. The high priest is the priest of the highest or most important great fetish. He has more power than the chief of a town or district, nay, in some respects even more than the king of a whole country. His orders must be unhesitatingly performed; for disobedience to his will is equivalent to disobedience to the great fetish whom he serves. Maltreated slaves can obtain their freedom by invoking any of the great fetishes. They make a certain sign and call on the great fetish by name to accept them henceforth as *his* slaves. The priest or high priest then sprinkles them with consecrated water, and he is made free; or, rather, he is the slave of the fetish alone, with whose priest or high priest he can remain, if he chooses, or depart whithersoever he will. Such are the chief points of the religion of the Gold Coast.

Language.—The principal language of the Gold Coast and its inland countries comprehends both Akán and Fànté dialects. Akán is chiefly represented by Asàntè and Akém, and in purity, extent, and importance prevails so much over the Fànté dialects, that we might even use this name as the common name of the language instead of the Chwee. As Akán is preferable to Fàntè, so the dialect of the people of Eastern Akém (Akém Abúàkwa) is considered the purest and nicest Akán dialect. "The Aquapems," writes the native missionary, David Asante, who took, and still takes, a considerable share in the literary cultivation of the Chwee language and its development—"the Aquapems are accustomed to embellish their spoken dialect by blending it with Akém expressions. Aquapem easily admits of enrichment and admixture from Akém, and even Fàuté, and Fàntè also admits and receives such foreign

elements; but if the same should be done in the Akém dialect, it would not sound well." As to the position which the Chwee language holds among the African languages in general, there is no doubt that it belongs to that stock of languages which have been termed "Prefix-pronominal," the principal characteristic of which is the employment of prefixes in the formation, classification, and pluralisation of nouns, and in representing them (before other parts of speech).

For further information on these points let me refer those interested to 'A Grammar of the Asànté and Fànté Language, called Tshi (Chwee), based on the Aquapem Dialect, with reference to the other (Akán and Fànté) Dialects.' By the Rev. J. G. Christaller, of the Basle German Evangelical Mission on the Gold Coast, published at Basle last year (1875).

XI.—*Notes of a Journey from the River St. Francisco to the River Tocantins and to the City of Maranhão.* By JAMES W. WELLS, C.E.

ON the 15th of February, 1873, I started from Rio de Janeiro, in company with other members of a staff of engineers, for the purpose of surveying the ground for the prolongation of the Dom Pedro Segundo Railway by the rivers Paraöpeba and St. Francisco as far as the Cachoeira (cataract) of Pirapora, on the last-named river. From this point the navigation of the river St. Francisco is open and uninterrupted as far as the noble waterfall of Paulo Affonso.

On the 5th of January, 1875, the surveys being completed, I bade adieu to my companions at Pirapora, and started on my journey to Cidade da Barra, 740 miles by river from Pirapora. I went by land at first; passing the mouth of the Rio das Velhas, through the villages of Coração de Jesus and Contendas, on the east side of the river, to the city of Januaria, where I crossed the river and proceeded by the river-side road, on the west bank, to the town of Carunhanha. Here, finding the roads very much flooded, I sold the mules and embarked in an ajoujo (*i.e.*, two canoes lashed together and planked over): in this crazy concern I proceeded to the Cidade da Barra do Rio Grande, situated on the mouth of the river of that name. I suffered intensely on this river-journey at night from the attacks of mosquitoes. As all the country to this point has been travelled over and described by various travellers, I shall avoid any description, and proceed at once with the sketch of the

journey to the Tocantins and thence to the sea. On the 26th of February, 1875, after a 10-days' stay with the hospitable people of Cidade da Barra, I engaged a passage in a barca returning up the Rio Grande. At the same time I engaged a troop of mules to meet me at the mouth of the Rio Preto, 56 miles up the Rio Grande.

The Rio Grande is one of the most important affluents of the St. Francisco—important not only for its size, but for the combination of navigable streams that flow into it. It is navigable for vessels of 3 to 4 feet draught, as far as the town of Campo Largo, 180 miles from its mouth. Its average width is 318 feet, depth 10 feet, and its velocity 2 feet 4 inches per second. All this length is perfectly free from obstacles, and for yet 80 miles between Campo Largo to Limoeiro; but this last length is troublesome on account of the rapids at some bends of the river. Its chief affluents are Rio Preto, Rio Branco, and Rio das Ondas, all more or less navigable.

I entered the barca (a sort of barge with a commodious cabin built on the deck at the stern) and the polemen, four in number, pushed off.

As the river was very full, our progress was slow. At times the polemen could not reach the bottom with their poles, and in an instant we drifted down stream, soon losing an hour's hard work.

Soon after leaving the town the pilot directed the barca into a lagoa, or overflow from the river, in the adjoining low-lands. Here the progress was better, but many and many times a passage had to be cut through the intervening bushes. It was a slow and wearisome progress, but, nevertheless, better than navigating against the strong current and deep water of the main river.

I found the greater part of the adjoining lands to be very low and flat, and covered with a short, arid grass and a scrubby vegetation. In some places the inundations extend for many miles inland. In these lakes are numerous water-fowl, spoonbills (*Culhereiros*); and a magnificent white crane, 4 feet high, with a white body and black head and neck, locally termed *Jaburu moleque*. There were also many other varieties of the crane family, with two species of wild duck.

At sunset, the barca was hauled alongside the sandy bank and secured for the night. Fires then lighted, and dinner prepared and eaten, in a few moments the tired men were asleep, to be away again with the first light of dawn. The nights, though warm, were not disagreeably so, the thermometer registering 76° to 78°, and 82° to 84° at midday in the shade. The remarkable absence of mosquitoes is a notable fact in this river.

Feb. 28th.—The morning broke bright and clear; our progress was miserably slow, the stream being very deep, and nothing was to be seen of the banks but dense bush. At 11 A.M. we reached Estreita da Serra, a narrow part of the river where it passes through a gap in a range of low hills that intersect the line of the river at this point. Looking out of the cabin window, my eye rested first on the long belt of mauve-coloured water-lilies (*golfoës*) skirting the margin of the stream, then rose to the thick, scrubby bushes of the banks; above which, a little inland, rear up, in graceful prominence, a few Carnahuba palms, their spiral stems and feathery foliage standing out in relief against the sombre forest-clad point of the serra behind. The Carnahuba palm (*Copernicia cerifera*) is one of the most useful trees in Brazil. In these districts it exists only in small numbers, but in the provinces of Ceará and Rio Grande do Norte it grows uncultivated in great luxuriance. Perhaps there is no region of the globe where a tree can be found of such varied uses and so serviceable as this palm. It resists the most severe and longest droughts, keeping always green and flourishing. The roots possess the same medicinal properties as sarsaparilla. From the trunk are extracted strong, light fibres capable of receiving a high polish. The wood is used for props, joists, and other building purposes; as also for stakes and fences, and for musical instruments, tubes and pumps. The inner rind of the young leaf, when fresh, is used as a highly-esteemed and most nutritive food. The tree also affords wine, vinegar, a saccharine substance, and a great quantity of gum like sago, and possessing the same properties and taste. It has often been the only food of the inhabitants of Ceará and Rio Grande do Norte in times of severe drought.

A species of flour, like maizena, is also extracted from it, and a whitish liquor like the liquid contained in coco-nuts. The soft, fibrous substance in the interior of the stalk, and that of the leaves, is a perfect substitute for cork. The pulp of the fruit is agreeable to taste; and the kernel, which is very oily and emulsive, after being roasted and pounded, is used as an excellent substitute for coffee. Of the dried leaves are made mats, hats, baskets, and brooms; and the straw is already sent to Europe in great quantity to be made into fine hats, some of which are sent back to Brazil. From the leaves is extracted a kind of wax, much used for making candles, which are extensively consumed in the northern provinces.

March 3rd.—We arrived at Boquerão, a small collection of houses at the foot of the Serra do Boquerão, near the mouth of the Rio Preto. Here I left the barca, and travelled by land up the Rio Preto (Black River).

The village of Boquèrão, consisting of 25 houses, a few of adobe and tiled, but most of them built entirely with materials obtained from the Carnahuba palm, is situated on the east side of the Serra do Boquerão. This serra is a low range of hills branching from the great watershed serra near Paranagua in the north and crossing the River St. Francisco a little below Urubú. It runs almost north and south. It rises between 300 and 400 feet above the neighbouring plains. Its surface is comparatively regular, and thinly covered with forest, but in places its outline is broken by masses of rock—a species of compact gneiss veined with crystal and white quartz.

In its forests are immense numbers of Caetetús, a species of peccary (*Dicotyles labiatus*, and *D. torquatus*); also the Guará or red wolf (*Canis jubatus*), the Sucuarana or puma (*Felis concolor*), and many other animals. This village of Boquerão, though now so insignificant, will be in the future unquestionably an important place, when the rich, fertile, and grazing districts of the interior become more populous, and the navigation of the fine rivers Grande, Preto, and others, is opened up.

Entering the valley of the Rio Preto, we found the country very different, consisting of a loose sandy soil, extending to the foot of the Serra do Boquerão, with numerous shallow lakes of water, abounding in ducks and other aquatic birds. The land was only a foot or two above the then level of the river, and the ground covered with a thin, wiry grass, called *Capim agreste*, affording but little nutriment to cattle. In many places were little thickets of Carnahuba and Burity palms, with other trees, giving the country in many places a park-like aspect. The grass extended to the very edge of the river, where grew the Burityrana palm, and a large tree producing seeds like the castor-oil-plant, and from which the natives manufacture a very serviceable oil for their lamps. It grows in great luxuriance, and in vast quantities. Another tree bears a large brown fruit, about the size and appearance of a potato, which is largely used for making soap.

The Rio Preto (Black River) is so called from the dark appearance of the water, owing to its great depth; I never saw clearer water in a river. It is very winding, and its width is generally about 150 to 200 feet broad.

At night we always endeavoured to reach some of the small birdcage-like houses of the cattle-breeders: where, although everything was of the roughest, we were always kindly treated; the men slinging their hammocks from the rafters, and I sleeping on my camp-bed.

The appearance of the valley still continued more or less the same, sometimes gently undulating, but generally the same flat

plain. In places the country was thickly wooded, but the general appearance was that of a grassy plain with pools of water, and picturesque clumps of Carnahubas.

March 7th.—We reached the villa or town of Sta. Rita, built on the north side of the Rio Preto, and about 120 miles from Cidade da Barra do Rio Grande. It contains about 1400 inhabitants.

The journey to this point had been most satisfactory, the direction was excellent, and the river navigable. The great question was as to the best place at which to pass the hills forming the watershed of the St. Francisco and Tocantins. I was informed that a road accompanied the Rio Preto nearly to its source, and continued on to the Cidade da Palma, in the province of Goyaz, but that the descent from the Serra into Goyaz was steep and perilous. Accordingly I determined to explore the Rio Sapão (River of the Big Frog), and see where it sprang from, anticipating that at that point I might find the watershed more easy to pass.

I left Sta. Rita with many kind feelings towards the good people I met there. The weather now appeared to be changing to wet. The country also became vastly different, changing from the flat sand plains of the lower river to hilly country of clay soil and quartz rock, and in the greater part covered with dense forest. These forests are not so magnificent as in many parts of Brazil, the forests of the Serra da Mantaqueira, for instance, where the stately araucaria grows, being much grander. Yet they are invested with a degree of grandeur unknown in our latitudes. The peculiar features of these forests are the Barrigudo and the Gammeleira. The Barrigudo is a tree with a trunk growing sometimes to 80 or 90 feet high, and then branching out into horizontal boughs, half-way up it swells out to sometimes double the circumference of its base. The Gammeleira, a species of wild fig growing to an extraordinary height, is still more peculiar, for jutting out from its base are perfect buttresses, sometimes 10 or 12 feet high, consolidating and giving support to the giant. A kind of cotton is obtained from the Barrigudo; and canoes are often made from the Gammeleira, though it does not make the most durable kinds.

A few palms were also to be observed, peculiar to the forest, such as the Gariroba, Palmito, and Seribá, the young leaves of which form an excellent substitute for cabbage, though it seems most fearful vandalism to destroy such beauties of nature for so mean a purpose. In passing through these forests we frequently smelt a peculiar musky smell. This is very common, and is the peculiarity of a certain shrub, and also of the odour exhaled by snakes.

Very heavy rains now set in, making our progress slow and uncomfortable.

March 13th.—Reached the village of "Formosa" in a fearful storm of rain. In a short time I managed to procure an empty house, belonging to the sub-delegado, or police-agent. Within half-an-hour the house was crowded by my curious neighbours, to inquire what I wanted, who I was, if I had anything to sell, or wanted anything to buy. Their astonishment was great when they found I was one of the far-famed "Ingleses;" greater still when I told them I was only travelling to see the country; and unbounded when I told them I intended exploring the Rio Sapão. Fearful and many were the dangers and difficulties I was told I should encounter; but, as no one of them had ever been there, I put no faith in their representations. Not so, unfortunately, the men I had brought with me; they immediately took fright, and refused to proceed further. Moreover, the rains had now set in; and I was informed they would last till the end of the month, and that the country beyond would soon be flooded, effectually barring all progress. I decided, therefore, most unwillingly, to await the cessation of the rain. The event proved that I was fortunate in doing so, for it rained day and night continuously until the end of the month, as had been predicted. Formosa is merely a collection of some sixty squalid huts and houses, picturesquely built in the midst of a wealth of vegetation. Trees and bush grow in every unfrequented space. In many places the weeds were so high in the street as effectually to prevent a view of the houses on the opposite side. The climate is warm and moist, but healthy, and the soil is of the richest; and the inhabitants, after the rudest fashion, and with little labour, rear crops of maize, beans, rice, sugar-cane, castor-oil plant, and mandioca, the surplus of which they send down the river in rafts, made of the dried stems of the leaves of the Burity palm, to Sta. Rita and Cidade da Barra. Truly this district is a wonder of vegetable wealth. Intermittent fevers, so common in similar districts, are here very slight; and what there is of them is, I believe, only owing to the bad living and filthy habits of the inhabitants.

Game is not prolific in this district, having, I believe, been hunted down by the people, who are all fond of this occupation, and kill everything eatable indiscriminately at all seasons, consequently soon clearing the district of its game.

To prove what a man can do in such a country who likes to work, I will take the case of Senhor Jose Moreira da Cunha e Souza, the sub-delegado; now a hale, hearty, ruddy-faced man of sixty. He came here twenty years ago with only two slaves, and immediately set to work in clearing land which he called

his own, and which, as no one can show a better title, remains his. He is now comparatively rich in money, and has extensive tracts of sugar-cane, mandioca, beans, and rice. He has a mill, though certainly of the rudest construction; and he is now making a handsome income, to the intense disgust and jealousy of his less active neighbours.

At the end of the month the rain, as prognosticated, ceased, and we prepared for continuing the journey. I was advised to hire two mules to carry corn, as hunters who knew the kind of country I was about to enter said that it would be utterly impossible to obtain pasturage for the animals. Moreover, I was further induced to take an escort of four natives, making with my men, whom I had shamed into going on, eight in number. All were armed with the most old-fashioned of arms, Portuguese muskets and carbines, all flint-locks, that looked likely to prove more dangerous behind than in front. I induced these men to go with me, in consideration of paying them a large sum of money. They were all dressed in tanned deer-skin; hat, coat, vest, trousers, and boots. Two of the men I thought were an acquisition. One called Antonio da Lapa, a hunter, had spent his life in the chase, and had fought with, been captured by, and escaped from, the Indians. He was a tall, meagre, broad-shouldered man of fifty. The other was a half-civilised Indian, of the tribe of Cherentes, called José Trascuhyn. Whilst at Formosa I found the climate most delightful; the temperature by day 76° to 78°, by night 72° to 74° Fahr.

April 4th.—At last we started. Every one assembled to see us off, and kind wishes of "God speed" were interspersed with the most dismal forebodings; the friends of the men I took with me bidding them farewell, as though they never expected to see them again. Three of the men travelled on foot, including the Indian, who carried his bows and arrows. The distance was 32 miles to the mouth of the Rio Sapão, which we reached without incident. Here there is a collection of seven or eight houses, called Sta. Maria. It being on the Indian frontier, they are fortified after a rude fashion. This place, even in late years, has been the scene of many a fight with the Indians. The inhabitants relate story and anecdote enough to fill a volume. The place had also another interest, as it was here that Gardner, the botanist, passed on his way to Goyaz, by the road up the Rio Preto. But he made a mistake in saying that the Rio Preto flows into the Rio St. Francisco a little below Villa da Barra, and probably obtained this idea from the old maps, which erroneously show it so.

Up to this point I have found no serious difficulty or obstruction to the navigation of the Rio Preto by a small light-draught steamer. The only troubles are:—

Atoleiro	55	kilometres	below Formosa.
Porto Raso	37	„	„
Marimbondo	21	„	„
Iatoba	12	„	„
Raposa	7	„	„
Vão de Batalha . .	16	„	above Formosa.
„ Angico . .	19	„	„
„ Capivara . .	21	„	„
„ Brejo Grande .	31	„	„

These are all strong currents of water at various bends of the river, but not worthy of being called rapids. Of these Porto Raso is the shallowest, but I am told that even in the dry season it has 4 feet of water in its channel. A small steamer could pass all these obstacles with a good pilot, but any expense in removing rock, &c., would, of course, diminish the risk.

April 6th.—This morning we safely passed the mouth of the Rio Sapão, by swimming the animals, and passing the baggage in a canoe, and then proceeded on our journey by the south-western side of the river. We travelled only 10 miles this day, as we started very late, and made our camp by the side of a stream at the foot of a serra.

The River Sapão I found to be a very deep stream, flowing sluggishly through marshy land, but too narrow to be of any service as a navigable stream. Its banks throughout are densely lined, either with magnificent belts of forests, or thick groves of the Burity palms. The low undulating lands on each side, extending from 2 to 5 miles away from the river, are covered with the vegetation peculiar to the Campos Geraes of Brazil, ground palms, small bushes, stunted trees, and a thin, hard, coarse grass. Sometimes many miles were covered principally with the extraordinary-looking Canella d'Elma (*Vellozia*), with its beautiful lily-like flowers. Beyond these low-lands the land suddenly rises up almost perpendicularly, and becomes a vast arid table-land, but abounding in most of the kinds of game found in Brazil; such as the Porco do Matto, a true wild boar, rarely found anywhere else, and not to be confounded with the Caetetú or peccary; deer of several kinds—the Galheiro and the Campeira, the buck and doe of the Campos, and the stately Sussu-apara, the largest deer in Brazil, but whose flesh is not eatable. There is also the ounce or jaguar; the Suçuarana (puma), the black ounce, and the Guará; and near the river we saw numerous tracks of Capivara (water-hog), Paças, and

tapirs in extraordinary number. Red and blue, red and gold, and purple macaws, and green parrots, continuously flew by us, making the hill-sides echo with their discordant screeches.

The weather was glorious, and I never breathed a more exhilarating or healthy atmosphere than this of the valley of the Sapão. We travelled by the foot of the slopes of the table-land, thereby avoiding crossing the many streams and swamps that would have intersected our path nearer the river. One night the animals suffered fearfully from vampire bats, and some of the men were bitten. The animals presented a ghastly appearance; on one I counted seven punctures.

Pedestrians have to keep a sharp look out for tho Cabeça de Frade, a curious ground-cactus, growing to about one foot in diameter, and only an inch or so above the surface of the ground; it is covered with long sharp spines, which cause a fearful wound to any unhappy person who treads on them. Every night the whole conversation turned upon the Porcos de Matto, and the men seemed to dread a visit from them more than from the Indians. Though I had seen a few tracks of them, I thought their fears exaggerated, and did not place much faith in their representations. But on the 11th of April, as we were rounding the sources of a swamp, to which I gave the name of Nove Gaihos (nine branches), from that number of streams that we counted leading into it, we saw the ground furrowed and rooted up in all directions by the pigs; but though the pools of water had been very recently disturbed, we did not meet with a single pig. The men were very excited, expecting to be attacked. It would, indeed, have been awkward had we encountered the animals here, for the ground was covered with hard matted grass 6 feet high, and obstructed by dense masses of trees and bush, with huge boulders of stone scattered about.

We made haste to get away; and late in the afternoon, when we encamped, we had placed 4 or 5 miles between the dreaded locality and our camp. But old Antonio, one of our men, said they would be sure to follow us. Accordingly we made every preparation, by placing the pack-saddles and baggage in the form of a hollow square, making a breastwork 3 or 4 feet high. Those who had hammocks, slung them high up in the adjoining trees; the men were too sure of a visit to sleep for a long time, tired as they were. However, late at night, we posted two sentinels, and turned in. An hour or so before daylight I was awakened by the alarm of pigs. The men who had no hammocks hurriedly scrambled in behind the baggage. In an instant the pigs were on us by hundreds, gnashing their teeth in a most unpleasant manner, making a sound like the breaking of thousands of hard

dry sticks, while the stench from their bodies was most revolting. As every man had cartridges ready and arms loaded, they soon received a volley, and retreated, but charged again immediately; the men behind the baggage had then to fight with their long knives. Myself and the men in the hammocks were all safe, and made every one of our shots tell on the black seething mass of bodies. At first it was an anxious time, but the pigs gradually drew off to a more respectful distance, and, as we remained perfectly quiet, at daybreak they went away. Our baggage, though, had suffered terribly. The raw hide coverings of the pack-saddles were slit as though by an axe, and one of the men was badly hurt in the wrist. We found seven pigs dead, and four badly wounded, but numbers of the wounded must have got away. The men would not go for the mules until near mid-day, and then found them a long way off. These animals are true wild boars, with long projecting tusks, and thick black bristles on their backs.

April 14th.—Came on to a huge flat plain, 2 or 3 miles wide and 4 or 5 long, the centre forming a large swamp, with groves of Burity palms. Wherever we looked we saw no vegetation but the tall rank grass. This plain is situated in a valley surrounded by fortress-looking mountains, sloping steeply at their bases and almost perpendicular near the top. Their summits were flat, and appeared to be all on the same level. I conjectured this to be the high land forming the watershed, and that on the other side of the big swamp I should find water flowing westwardly.

I ascended one of the range of hills, and the sight that then met my view well paid me for the exertion. Looking westwardly, far as I could see, was one vast extent of undulating grass-land, brown with age. In the bottoms and valleys grew Burity palms, showing the presence of streams or morass, generally the latter. In the far distance were several ranges of hills and isolated heights. Some of the streams were lined with thick forest, indicating a rich soil. In a north-west direction I fancied I saw green grass, which would indicate the presence of man, as unless this *Capim agreste* is fired, its growth is continual for ages, and always presenting the same burnt-up appearance. I descended, and rounded the big swamp, and my conjecture proved to be right, for there we found water flowing westwardly. We found the descent on the west side considerably steeper than on the east; *this is a peculiarity I have noticed in all the mountain ranges in Brazil, running north and south.* We were several days wandering in these wilds. Although it is easy to decide on a line of route, it is altogether another thing to travel by it in an unknown country. Our

difficulties were the immense numbers of streams and swamps, and the frequent belts of forest.

These lands teem with game of various kinds. We killed a number of wild boar and deer, the latter remarkably tame. I also had to shoot a fine *Tamandua bandeira*, or anteater, to save my dog. We saw the tracks of numbers of tapirs, pacas, capivaras, onças, and suçuaranas. The perdice, or Brazilian partridge, existed in great quantities.

After a most wearisome journey of several days, our animals became utterly exhausted for want of proper forage. The corn I had brought had been finished some days, and the mules only had the dry hard grass to eat. Their gums were cut and swollen with the unpalatable stuff. Their chests and forelegs were denuded of hair, through forcing a way through the grass. Fortunately we always found plenty of water. As I knew we must be near the green grass I saw from the hills, I made a camp, and with two men on foot we started in search of habitations. We crossed streams, and forest, and swamp, making a bee-line towards where I wanted to go. After a few hours' fatiguing work, we emerged on to green grass-land. The men told me it had been burnt the last year. We plodded on, and ascended a height, where we saw smoke a mile or two away. We cautiously made towards it, and discovered it to be really a human habitation. Upon entering the house, the proprietor, a man and his wife, and six powerful bronzed sons, were speechless with astonishment. A few words explained all, and we were treated with the greatest kindness. I found that the streams I had been tracing were really affluents of the Rio do Somno, that flows into the Tocantins. My worthy host I found to be an immigrant from the neighbouring district of Paranagua, in Piauhy; he told me that a few miles further west was the village of Espirito Santo, formed during the past few years. I engaged him as a guide for several days in exploring the country. I found the high lands to be entirely covered with grass, the valleys full of thick forests, and the ground was not too marshy; there nothing but the Buriti grew.

20*th*.—To-day we arrived at the little isolated village of Espirito Santo, consisting of some twenty houses. The whole village is entirely self-supporting, being too far from any market either to buy or sell. The people only make long journeys to Paranagua, and thence to Sta. Rita and Formosa, to exchange hides for salt. My exploration will prove a great boon to these people, as showing them a better road by the way I came, and one which will save them several days' journey.

Near Espirito Santo is a small river called the Rio Somninho. This stream, when it joins the Rio Preto of Goyaz, becomes the Rio do Somno (River of Sleep). At its junction is a magnificent waterfall of 80 feet in one drop.

Leaving Espirito Santo, we found the country gradually changing to a more rugged and wooded district, but everywhere intersected by boggy low-lands. In these morasses exist immense numbers of the water-boa (*Sucurihu*), which sometimes attains the enormous length of 40 feet. I have been told that they attain 60 feet, but that I cannot vouch for.

During the next few days we passed a few isolated farms, and on the 23rd we reached Porto Franco, on the Rio do Somno, the last habitation. Here I was told the river was navigable; accordingly I dismissed my men and troop, and constructed a raft by tying into five long bundles, 10 feet long, the dry stems of Burity palms, and with three men and my baggage embarked on board the crazy affair. From this point to the mouth of the river it took us eight days to float down with the current. During this journey we were wrecked by dashing on to a submerged rock, and I suffered an irreparable loss of more than two hundred sketches, several valuable specimens of minerals, and other objects of necessity and interest. This Rio Somno is certainly the most picturesque river I have yet seen. The upper part flows between perpendicular walls of many-coloured rock, sometimes 100 or more feet high. Innumerable cascades of water trickle from the heights above; palms, and ferns, and flowers grow in every crack and crevice and shelf of the rock, presenting a most enchanting appearance. Often, on the surface of the rocks, I observed the huge nests of the Shupé bee, sometimes 20 feet long. They produce large quantities of wax and good honey. The lower part of the Rio do Somno flows through a much lower and more regular country. Here the river is bordered by forests of great luxuriance and vegetable wealth. The varieties of palms were very numerous, and most of them new to me, as the Najá, Bacabá, Marajá, and Piti. Here I also saw wild bananas. The Bacabá is a handsome palm, growing on a long, slender stem to a great height, the huge leaves forming at the top a fan, invariably facing the east and west.

In these forests we saw innumerable monkeys, marmosets, macaws, parrots, and other birds. Tapirs, capivaras, and alligators we constantly observed on the banks. A little away from the river the country is still the Campos Geraes, or grass-land, extending to the Rio Tocantins.

The river at Porto Franco is 200 feet wide, but at some of the bends it is 300 or 400 feet wide. Only in a few shallows is

the current at all strong, and then it is more of the nature of broken water than a rapid, the water rising into waves 3 or 4 feet high. These are locally termed "pancadas," or blows, and many a swamping they gave us; unfortunately we did not always manage to navigate our unwieldly craft so as to avoid the submerged rocks, and it was on one of these that our wreck occurred. But beyond these there are two serious impediments to navigation. They are the "Funil" and "Apertada Hora." The "Funil" is an obstruction caused by two huge masses of ironstone, about 80 feet long and 50 feet apart. Through this narrow channel the whole body of water of the river passes in a rushing, seething mass of whirlpools. The chief dangers are the strong eddies; nevertheless, I believe a small steamer could steam up against the current. The "Apertada Hora" is a much more serious affair. Above it the bed of the river is full of large boulders of rock, in amongst which the water rushes with surprising force. The only passage is by a tortuous channel on the north side, which is, however, highly perilous from the quantity of rocks on either side. After passing the rocks, the banks of the river suddenly narrow to within 25 or 30 feet, and the previously strong current of water, in this narrow strait, becomes hardly perceptible. This at first sight appears strange, but a plumb-line dropped into the water does not strike the bottom at 40 feet; it shows, however, a strong undercurrent. I am thus led to believe that the bank on the left or south side of this strait is merely a projecting ledge of rock, under which the great body of the water must flow. It is composed of a hard, compact stone. This narrow channel extends about 100 or 130 yards, and then making a sharp bend to the left, it widens to its usual width. The Apertada Hora is the great obstacle to navigation; but in the dry season, when the rocks are high out of the water, a good channel could be made by removing some of them, and by widening the narrow strait. There are numerous other places, such as the "Funil" and many strong currents over the shallows where any labour expended on removing rock, would greatly diminish the risk; but there are none which present such an almost impassable barrier as the Apertada Hora, and they might remain as they are, dangerous but passable. After passing the Apertada Hora, we found for the next few miles a little broken water from submerged rocks, and then the river became a deep, wide, and placidly-flowing stream to its junction with the Tocantins. We passed successively the mouths of the Rio das Balsas and the Rio Perdida, both large bodies of water; they are unexplored, but the Indians say they are navigable.

During this journey on the Rio do Somno I noticed the

strange absence of mosquitoes, or other torturing insects; in fact, the whole district from the St. Francisco to the Tocantins is singularly free from insect pests, including even carapatos (ticks), the greatest misery to travellers in Brazil.

May 2nd.—We arrived at the village of Pedro Affonso, on the south side of the mouth of the Rio do Somno. Until within the last four years it was an Indian village of the tribe of Cherentes. In 1848 the Italian Jesuit missionary, Fre Rafael, arrived in this savage wilderness, and amongst the then cannibal Indians; with patience and perseverance, he has subdued their unruly natures, and has induced them to forego their old nomadic lives, and to settle down to the cultivation of this vast wilderness. A few years after his arrival a few traders came, gradually elbowing out the native inhabitants. It is now a Brazilian village of some 400 or 500 souls. The Indians have removed to the mouth of the Rio Ipiabunha, 72 miles to the south. I remained at Pedro Affonso three days, having arrived unfortunately a few days too late to catch the last trading-boat descending the river to Pará. As it was, I engaged an igaritê, a wide, shallow boat, with three oarsmen and a pilot, to take me to Carolina, a town, or rather city, 185 miles down the Tocantins.

Pedro Affonso is a very straggling village, situated in the midst of grass-land, with scattered clumps of trees. The ground is high above any flood that is likely to come down the river, and the situation altogether showed the wisdom of the natives in choosing this for a settlement. I see that in old maps there is a place called São Laurenço, marked on the west bank of the Rio Tocantins, opposite the mouth of the Rio do Somno. As I could see no trace of it whilst at Pedro Affonso, I made inquiries of the oldest inhabitant, who told me that he had never heard of the name.

In going down this "Upper Tocantins" I must confess to being disappointed in the insignificant appearance of the forests bordering its banks; though, of course, tropical in character, they had neither grandeur nor beauty. Perhaps the long reaches and great width of the river tended to make everything else appear insignificant. The reaches of the river sometimes extended 8 or 10 miles, making the horizon of sky and water.

I was also very much surprised to find such a number of habitations on the river-banks: we rarely passed 3 or 4 miles without seeing a little hut and its small plantation. But the class of people dwelling here are of no benefit whatever to such a country as Brazil: they exist and vegetate, as the trees and animals around them; they are surly, proud, and independent. Here nature is so generous, that their trifling necessaries of life are obtained almost without trouble. The river abounds in fish, and

the forest with game; and a few roots of mandioca, put in the ground, supply them with their bread; their clothes they prepare from the tanned hides of deer, &c. In descending the river, I frequently saw the fresh-water dolphin rise to the surface, and with a deep sigh send a cloud of spray into the air: a large quantity of oil can be obtained from this fish, but it is not utilised.

The journey on the Tocantins was rather enjoyable than otherwise, for it being one of the cool months, the heat of the sun, though great, was tempered by a delightfully fresh breeze up channel. The thermometer daily registered 82°, to 84° at mid-day. We generally passed the nights at some river-side hut, where the men slung their hammocks; I preferred for myself a hide on the ground by the side of the fire, to the mosquitoes and filth of the houses.

Near the mouth of the River Manoel Alves, a few miles to the south of the city of Carolina, a range of hills of most fantastic forms, isolated and in groups, crosses the line of the River Tocantins: they are a branch of the great watershed range of the Tocantins and St. Francisco rivers, and after traversing the Tocantins, run into the range of mountains forming the watershed of the Rivers Tocantins and Araguaya. These mountains are reported to be rich in gold, several specimens having been found; but they have never been worked or explored properly, the districts being in Indian territory.

About 30 miles to the north of the mouth of the Rio do Somno is the site of a recent village of the Coroados Indians, who have removed, with their Italian Jesuit missionary, Fre Antonio, to the head-waters of the Rio do Manoel Alves. They still retain their habits and customs, but are now friendly disposed to the Christians, as the Brazilians are termed by them. The Rio do Manoel Alves forms the southern boundary between the province of Maranhão and Goyaz.

May 11th.—Landed at the city of Carolina and proceeded to the house of the Judge of the district, Dr. Benedito Barros e Vasconcellos, by whom I was most hospitably received, though I was a perfect stranger to him, and carried no letters of introduction. He advised me strongly not to entertain the idea of descending the river to Para, as at that time of the year the river below was fearfully unhealthy, and the rapids impassable through insufficiency of water. Moreover, small-pox was then making terrible ravages below the mouth of the Araguaya. I accepted his advice; but it was sixteen days before I could get horses to proceed on my journey.

Carolina is an old settlement, formerly an Indian village. It ranks as a cidade or city, but it is a small insignificant place of

about 1500 inhabitants, like all the other Brazilian towns and villages, a square with a whitewashed church, and houses of adobe, tiled or thatched. During my stay I was very much pleased to see the kind and friendly feeling that existed in this little place. Usually these out-of-the-way towns are in a perpetual state of ferment from politics, jealousy, or intrigues.

Carolina itself is built on a sandy plateau of grass land, high above any river-floods that may chance to come; but the immediate neighbourhood is very rough and mountainous, some of the hills being of very fantastic forms. The temperature I found to be usually about 81° Fahrenheit.

May 27th.—I left Carolina to return now to the sea-coast across the province of Maranhão. My troop was a very sorry-looking one, both men and horses, compared to the active Mineiros of Minas Geraes, and the excellent mules of São Paulo. Apparently every province has its system of packing a mule and of travelling; but the farther north we go, where animals get scarcer, the muleteer becomes far less expert, and men, animals, and pack-saddles are clumsier. A large party of the Carolinenses accompanied me a few miles, and as the country is the open Campos Geraes, my friends showed their expert horsemanship by chasing the grazing cattle, when they would dash alongside a runaway bullock, seize him by the tail and turn the astonished animal upside down.

The first night we passed at a herdsman's hut, at the foot of a considerable hill of lime and sandstone, called Morro do Chapeo (Hat Hill), and a prominent mark for an immense distance around. The next day we travelled through a pass in the range of hills surrounding Carolina: it was a fearful road, a bridle-path obstructed by hugh boulders, winding round the steep side of a hill; on one side the hill became a precipice, densely clothed with forest. One horse slipped and fell over, but the trees caught him feet uppermost. He was none the worse for it.

The second night we passed at a small farm, called Angelino, 28 miles from Carolina. Here is another example of what can be done by a hard-working man in Brazil. The owner, a negro, was in his youth a slave; but obtaining his freedom, he and his wife set earnestly to work. He has now a rough mill for grinding sugar-cane, another for mandioca, a neat house, numerous sheds, large tracts of land, fenced in and under cultivation, and a herd of 1200 cattle; and his only assistants are his two sons and his wife.

After passing these hills the land became more regular, sometimes long flats of sandy wastes, thinly covered with grass, and a few trees; or in the lower parts boggy land, densely covered with

matted grass and bush, through which we went with great difficulty. By the side of the principal streams we always found belts of woodland, in which grew an immense variety of palms, many new to me, such as the patí and the junçerera—and a beautiful tree, with a tall straight trunk, a bright yellow ochre in colour, the leaves a most brilliant green, and thickly covered with a crimson flower: it is locally termed "Moleque." Another tree I saw, new to me, and peculiar, I believe, to this province; it is termed the "Merim." It is a large, widely-spreading tree, with a rugged rough bark. Upon gashing the tree, a volatile inflammable fluid oozes out, at first smelling like kerozene, but on exposure to the air its odour changes to the delicate perfume of violets. I am told that it yields an immense quantity of oil, but is not applied to any use. This tree is but little known, even where it grows.

May 30th.—We arrived at the Serra da Cinta, a range of hills dividing the waters of the Grajahu and Pinaré from the Tocantins: it comes from the highlands of Piauhy and runs northerly. After passing this serra the road became very rugged, crossing spurs of the hills, where horses and men had to climb up steep ascents and over huge boulders of rock. The soil, where not stony, was a stiff clay; the land generally was thickly wooded. The neighbourhood here is reported to be rich in minerals, gold and copper having been found, the latter in vast quantities, but as yet it has not been worked. From one of the heights we crossed we obtained a magnificent view of the country we had passed—extensive undulating tracts of grass-lands, with here and there isolated hills rising up in curious forms: one I observed, called Morro de Castello, is a tall round rock, with perpendicular sides, in shape like a martello tower. The horizon was bounded by distant blue serras a long way off, but the air was so clear that we could distinguish their configuration and valleys.

The last day or two of this journey was over a table-land country; the rivers passing through valleys 200 or 300 feet below the adjoining plain of grass-land, the descents to the streams were most precipitous, and the valleys were densely wooded.

June 3rd.—Arrived at the villa or town of Chapada, on the Rio Grajahú. Here terminated my journeys by land. It was high time that I arrived here, for the men who had travelled on foot were terribly exhausted, and three of the horses I had to leave on the road, for which I was only enabled to get one in exchange. It was the deep, heavy, sandy roads that were so fatiguing; on some occasions we travelled for three or four hours over sand where the horses sank to their fetlocks. The

country from Carolina to the Grajahú is all more or less populated, thinly of course, the houses being distant from each other sometimes 30 miles. It is a very healthy district, and in many parts there are tracts of rich land; the greater part, however, is barren sand or stony wastes. I believe it to be immensely rich in minerals.

As the class of inhabitants in this district is very low and ignorant, we were but indifferently received at some of the farms; but at others we were kindly treated. Upon my arrival at Chapada, the District Judge, Dr. Candido Pereira de Lemos, kindly offered me the hospitality of his house, which I willingly accepted, and remained there three days, whilst getting ready a boat to descend the Rio Grajahú.

The Villa de Chapada is an old settlement, situated on the east side of the river. The little praça or square occupies the summit of a hill; the rest of the town is scattered around the base of the hill, and on the banks of the river. On the west bank is the village of Trezedellas. A thriving trade is carried on here with the surrounding country, the traders taking down the river raw hides, and returning with cotton goods, salt, and hardware. The soil is a thin stratum of clay, covering a substratum of stratified rock. This rock, which extends for many miles, is rich in copper, many rich specimens of which I saw. The distance by road from Carolina I estimate to be 188 miles.

At this place I saw an Indian girl of the tribe of Anambeios, from the River Tocantins, below the mouth of the River Araguaya. She was almost a white, with very good features and brown eyes. I should never have thought she was an Indian had I not been told so. I was assured that all her race are as pale as she, being known as the White Indians. Several other Indians from the neighbourhood I saw—the Guajajaras and Gammellas—men short in stature, very deep-chested and powerful in build, light-brown in colour, and in physiognomy decidedly of the Mongolian type.

June 6th.—Embarked in a boat with four oarsmen, pilot, and servant, and started on my voyage down the Grajahú. The river at the town is 109 feet wide and 3 to 6 feet deep; but it is now almost the driest season. The banks are high and rocky, and densely covered with forest. In many cases the branches of the trees interlaced overhead from the opposite banks, forming a most delightful scene. The upper part of the river, where the land is very hilly, is thinly inhabited; but a day or two down the river all habitations cease, as the country then becomes a vast virgin forest, extending to the Tocantins and Para. In this forest-district reside many tribes of Indians, some hostile and some friendly to the whites. Almost every day we met a trading

boat returning to Chapada, the crew often composed of young Indians, generally in a state of nudity. It is fearfully laborious work poling these heavy craft up against the strong current.

This journey on the Grajahú proved to be the most unpleasant I have made in Brazil; for after we had quitted the highlands we passed through a vast extent of lowland and morass, through which the river flowed in the most circuitous manner. Here by day the heat was terrific, and the sand-flies (pihuyn) in dense clouds, with their irritating bites, soon brought us to fever-heat. At night mosquitoes, in myriads, effectually killed all thoughts of sleep, with their tantalising humming and stinging. The men, tired out, slept through it all; but with the pilot and myself it was hard times.

One day, whilst the men were preparing dinner, I strolled into the forest. These virgin forests are different from anything of the kind I have seen before; for a little way from the river the ground, covered deep with the decaying leaves of centuries, is perfectly free from bush, and I could sometimes see so far into the forest that the distant trees looked blue with the distance; but overhead, branches and foliage were interlaced together in one entangled mass of creeper and vine: from the branches the creepers dropped their air-roots like ropes, to take fresh life from the ground. These forests abound in *jôó*, or quail, whose melancholy notes alone disturb the solemn silence of the woods.

In the river we caught several excellent fish; but the prevalence, in immense shoals, of the ferocious piranhas, similar to the piranhas of the Rio St. Francisco, effectually prevented any bathing. On one occasion I was shown an electric eel, *tremé-tremé*, or *peixe-d'anguia*, or *poraquá*, as it is variously termed.

June 12th.—This morning we passed a village of the Itambeira Indians, but unfortunately they were away collecting oil of copaiba: we saw their encampment a few days afterwards. The banks of the river are very picturesque, bordered as they are by all the beauties and wealth of a tropical vegetation—palms of several kinds, tree-ferns and graceful bamboos, and trees festooned in flowers; amongst which gamboled several varieties of monkeys and marmosets. Macaws, parrots, toucans, and other birds, flashed their gaudy plumage everywhere; long-necked white herons and other aquatic birds flew ahead, almost skimming the water.

As we were favoured with a bright moon, we took advantage of its light to continue our journey until late into the night. The only danger one is exposed to by this travelling at night is the snags, or submerged fallen trees; we ran on to several, and one occasion had to cut up the tree with axes before we could get free; however, no serious accident occurred. It is unfortu-

nate that this river is so very winding, as it almost trebles the actual distance. A road has lately been cut through the forest from Chapada to Victoria on the Mearim; but as a good part of it is through land subject to inundation, and the traffic is almost *nil*, in a very short time it will be all grown over and useless. It was intended as a means of bringing down cattle from the grazing plains near Chapada; but one or two men tried it and found that it did not answer their purpose, as they lost 80 per cent. of the cattle on the march, through insects, starvation, poisonous plants, and boggy land. Near the mouth of the Grajahú the water of the river assumed a tint like weak coffee, owing to the overflow of the neighbouring lakes and swamps; we had to travel for two days and nights continuously, as we could find no dry land anywhere—all the adjoining land of the Grajahú and of the River Mearim being under water. From this point to the coast we saw no more forests worthy of the name, the whole of the land being a low plain, the greater part subject to inundations. We travelled down the River Mearim almost to the town or villa of Victoria, before we saw dry land.

June 17th.—Landed at Victoria, a town of about 2000 souls, on the north bank of the Rio Mearim. It carries on a considerable trade with the coast and the interior; it is built on slightly rising ground, but the country around is very low and flat; so much so that in the rains, it becomes a series of lakes connected by channels, enabling people to cross from the Rio Mearim to the Rio Pinaré in canoes. Intermittent fevers and agues are not so prevalent as one would be inclined to think, on looking at this vast extent of stagnant water in a tropical climate. The climate is warm and moist, and not unhealthy. I proceeded the same day on to Arary, a village a few miles down the river: here I waited a few days, and on the 20th of June I took a passage in a sailing vessel, loaded with oranges, bananas, fowls, &c., for the capital.

Steamers now ply between the coast and ascend the Rio Mearim as far as Corda, an eight days' journey. Another line ascends the Rio Pinaré. A small tug-steamer on the Rio Grajahú might pay well.

Soon after passing the confluence of the Pinaré with the Mearim, the river widened out to a mile or more in breadth. Here we had to await every change of tide, as at low-water the greater part of the bed of the river is exposed in long shoals of soft black mud. We had to wait here amidst myriads of mosquitoes and a burning sun. The scenery was most melancholy; the banks were of mud, like London clay, topped by the weird roots of mangroves, amongst which flocks of red flamingoes

disported themselves. On this river, at the commencement of the flow of the tide, a huge tidal wave, 6 to 10 feet high, comes rolling along, and woe to the boatman who has not placed his vessel in safety. Even where we were, generally at the mouth of some creek or behind a bank, the commotion of the water was very great, and the water returned with the force of a mill-race.

On the 25th of June I landed at Maranhão, and the same day embarked on a coast-steamer for Bahia. The change was very great, and at sea I gave in at last to a severe attack of fever.

XII.—*Journey of Exploration from South to Western Australia, in* 1875. By ERNEST GILES.*

ON arriving at Youldeh, a point which we reached after a troublesome and difficult march from Beltana, the main body of the expedition remained in depôt, whilst I visited Fowler's Bay to the south, at the same time despatching my two officers, Mr. Tietkens and Mr. Young, with my black boy Tommy, to endeavour to discover a new depôt to the north, at or as near to the 29th parallel of latitude as possible. When I returned from Fowler's Bay they also had returned from the north, having discovered two native wells, a small native dam, and some claypans, each having water in, and at different places. This was exceedingly good news, and I wasted no time before I departed from Youldeh, giving my letters to Richard Dorcy, who had accompanied me back from Fowler's Bay. I will now give a condensation of Mr. Tietkens's report of his journey with Mr. Young.

On leaving Youldeh, which is situated in lat. 30° 24′ 10″, and long. 131° 46′, they went first to a small rock waterhole I had visited when here previously in the summer; it was 15 miles away, and lay about N. 74° W., and called Paring. The black boy Tommy followed my old horsetracks to it, but on reaching it they found it dry. The following day they travelled north, and passed through a country of heavy sandhills and thick scrubs, with occasional open patches with limestone, and camped at 24 miles. Continuing their journey the next day, they went over better country and more open, and made 24 or 25 miles of northing. Some more good country was seen the following day, but no water, though they saw native huts and native tracks. On the following day they sighted two small flat-topped hills, and

* Being the substance of a Report furnished by Mr. Giles to the Hon. Thomas Elder, of Adelaide, who fitted out the Expedition.

found a native well in their neighbourhood, which, however, did not promise a very great supply of water. The views obtainable from the little hills were not very inviting in any direction, as scrubs appeared to exist nearly everywhere. This little well was 82 miles from Youldeh, and lying nearly N. 10° W. from it. They continued on further north for 25 miles to lat. 28° 52′ 10″, and long. 131° 31′ 8″, when they turned to the south-west, and continued on that course for 18 miles, finding a small native dam with water in it; then turning a little to the north of west they found some claypans with a little more water. They went 44 miles nearly west from the little dam, and though the country seemed improving they could discover no more water. From their farthest westerly point in lat. 28° 59′, and long. 130° 29′, they turned upon a bearing of S. 55° E. direct for the native well found near the two little flat-topped hills mentioned previously. In their progress upon this line, at 45 miles, and right before them, they came upon a small, open, flat space, very well grassed and very pretty, and upon it they found another native well, and saw some natives, with whom they held a sort of running conversation. There were several wells, all of which had water in. Their black boy managed to elicit from the natives the name of the place, which they said was Ouldabinna. This seemed a very fortunate discovery indeed, as the first well found near the flat-tops was by no means a good one. Here they encamped, being quite delighted with their successful journey, as they now had found a new depôt 92 miles, lying N. 20° W. from Youldeh, the position of this spot being in lat. 29° 7′ 4″, and long. 131° 15′ 4″. From here they departed in a straight line for Youldeh, where they arrived the day before I returned from Fowler's Bay.

On Tuesday, the 27th of July, having nineteen camels and provisions for eight months, and a most perfect equipment for water carriage and otherwise, we left Youldeh. Richard Dorcy and his black boy went away to the south; my caravan departed in a long single string to the north; and Youldeh and the place thereof knew us no more.

On my departure from this depôt I had the choice of first visiting the native well my officers had found at 82 miles, and thence to the further one at Ouldabinna. I decided to go straight for the latter, as the other was not so good. The weather was cool, and the camels could easily go there without water. Their loads were excessively heavy, averaging about 550 lbs. all round. It took us six days to reach the new depôt. The country nearly all the way consisted of mallee scrubs and spinifex sandhills, with occasional grassy flats between; and at one place we actually crossed a space of nearly 10 miles of open

good limestone grassy country. By the time I reached Ouldabinna I had travelled 1010 miles from Beltana.

Ouldabinna I found to consist of a small and pretty little open space amongst the scrubs that surrounded it, and on it a place where the natives for untold ages have obtained their water supplies. There were several wells, but my experience immediately informed me that they were simply rock holes filled with soil from the periodical flow of the rainwaters over the little flat —they lying on the lowest ground; and I perceived that the water supply was most ungratifyingly limited, though there was a sufficiency for our immediate requirements. The camels were not apparently thirsty when we arrived, but drank more the following day, which completely emptied all the wells, and our supply then depended upon the soakage, which was of such small volume that I was greatly disappointed in my new home. I wanted water here only for a month, but it seemed probable it would not last a week. We deepened all the wells, and were most anxious watchers of the fluid as it slowly percolated through the soil into the bottom of each well. After I had been here two days, and the water supply getting less, I very naturally became most anxious to discover more, either in a westerly or northerly direction, and I again sent my two officers, Messrs. Tietkins and Young, to the north to endeavour to discover more water, while I determined to go myself to the west on a similar errand. I was desirous that my two officers should share the honour of completing a line of discovery from Youldeh northwards to the Musgrave Ranges, and thus connect that great geographical feature with the coast at Fowler's Bay; and I promised them if they were fortunate and discovered more water for a depôt to the north, and I be equally successful to the west, they should finish their line, which, ending at the Musgrave Ranges, would form of itself a very interesting expedition. These ranges lay nearly 200 miles to the northward from here, and knowing them to exist, and they being a high (the highest in South Australia) and continuous chain, I had every reason to expect that my officers would have no difficulty in finding water between here and there, especially as when I discovered that chain of mountains I had seen other ranges to the south and south-west from them. Their present journey, however, was only to find another depôt and return, as the water supply here might cease at any moment; as at each succeeding day it became considerably less.

This was otherwise a pleasant little oasis, as there was plenty of good herbage for the camels, which enabled them to do with very little water after their first skinful. We arrived here on Sunday the 1st of August, and left it again on the 4th. Mr. Tiet-

kens and Mr. Young took only their two riding camels, and one other to carry water and other things; they took thirty gallons of water and provisions for nine or ten days, as I expected they would easily discover water in less than 100 miles, when they would immediately return, and it might be necessary for them to remove the whole camp from this place. I trusted all that to them, requesting them at the same time to hold out at Ouldabinna (on their return) as long as it was possible, as if I returned from the west unsuccessful my camels might be unable to go any further, and being quite sure that the country to the west was not likely to prove a garden of Eden. I thought it probable I might have to go 200 miles before I found any water, and if unsuccessful at that distance, I should have precisely the same distance to come back again; so, with the probabilities of such a journey before me, I determined to carry out two casks of water to about 90 miles, send some of the camels back from there, and push on further with the remainder. I therefore took six excellent camels, three for riding and three for loads, two carrying thirty gallons of water each, and the third carrying provisions, mugs, &c., &c. I took Saleh, my only Affghan camel driver, and young Alec Ross—Saleh to return from where I would plant the casks, and Alec and I would go on. Mr. Tietkens and Mr. Young left Ouldabinna the same day as I did, that is to say on the 4th of August, one party going north and the other west, leaving Peter Nicholls (my cook), and the black boy Tommy to look after the camels and camp. I will first give an outline of my journey to the west.

The country, except in the immediate neighbourhood of the wells, was, as usual in this region, all sandhills and scrub, though at 18 miles I came upon the shores of a large salt lake, which had numerous sandhill islands scattered about it. It appeared to extend a vast distance southerly. By digging we easily obtained a quantity of water, but it was all pure brine, and utterly useless to us; after this we met lake-bed after lake-bed, all existing in dense scrubs and sandhills for 60 miles; some were small, some large, though none of the size of the first one. At 78 miles from Ouldabinna, having come as nearly west as it was possible to steer in such a country on a camel, we had met no signs of water fit for man or animal to drink, though brine and bog existed in most of the lake-beds. The scrubs were as thick as possible, being chiefly mallee with spinifex; we could seldom get a view 100 yards in extent; and we wandered on farther and farther away from the only place were we knew that water existed. At this distance, on the shores of a salt lake, I sent Saleh back with two camels, this being the middle of the fourth day. Saleh would have to encamp by himself for at least two

nights before he could return to the depôt, and the thought of such a thing almost drove him distracted, for I do not suppose he had ever camped by himself in his life previously. I, however, carried the two casks his camels had brought until Alec and I camped on the fourth night, being now 90 miles from Ouldábinna; after Saleh left we passed only one more salt lake, and then the country became entirely bedecked with unbroken scrubs, while spinifex covered the whole ground. The scrubs consisted mostly of mallee, with patches of thick mulga, casuarinas, sandal-wood, and quandong-tree. No traces of any human inhabitants were seen, nor, were they ever present (in all other parts of the Continent) tracks of native game or wild dogs distinguishable upon the trackless sands of this previously untrodden wilderness. The silence and the solitude of this mighty waste were appalling to the mind, and I almost regretted that I had sworn to conquer it. The only sounds the ear could catch, as hour after hour we slowly glided on, was the passage of our noiseless treading and spongy-footed ships, as they forced their way through the live and dead timber of the hideous scrubs that environed us, and thus we travelled on. At our sixth night's encampment we had left Ouldabinna behind us 140 miles. I did not urge the camels to perform quick or extraordinary daily journeys, as upon the continuance of their powers and strength our own lives depended; no water had yet been met, nor had any place where it could lodge been seen, even if the latter rain had descended upon us—except, indeed, in the beds of the salt lakes, where it would immediately have been converted into brine. On the seventh day of our march we continued on, and had accomplished 15 miles, when our attention was drawn to a plot of burnt spinifex, and the tracks of one or two natives of a somewhat recent date; this set us to scan the country in every direction where any view could be obtained. Alec Ross climbed a tree with a pair of field-glasses, discovered and informed me there was a fall of country into a hollow, with an apparently broken piece of open grassy ground some distance away to the south-west. I therefore determined to go to it, whatever might be the result. In 5 miles we were disgusted to find that it was simply the bed of another salt lake; but as we saw numerous tracks of natives both going to and coming from it, we persevered until we reached the shore. The bed of the lake was quite dry; there was very fine herbage round the edges, and we turned our four camels out to graze on it. The day was exceedingly hot for this time of year—the thermometer standing at 95° in the shade. We first had some dinner, and then went exploring. There was a very inviting-looking spot at the opposite end of

the lake, and Alec went to inspect it and any other likely places, while I dug wells in the bed of the lake. The soil was reasonably good, rich, and moist; and, on tasting it, I could discover no taint of salt, nor had the surface the same sparkling crustation of saline particles as I had seen upon all the other lakes. At 10 or 11 inches I reached the bed rock, and found the soil rested upon a rotten kind of bluish-green slate, but no water rewarded me in any of the numerous holes I dug, and so I gave it up in despair, and returned to the camp to await Alec's return and the report of his travels, as there was only one place to inspect which gave any promise, and to which he had gone. He was a long time away, and it was getting very late when he returned; on his arrival he rejoiced me with the news that having met a number of fresh native tracks, all trending round to the spot that looked so well from here, following them they took him to a small native dam in which there was a supply of yellow water. His information, however, was qualified by the remark that there was not a sufficiency of water there for all our mob of camels, though there was plenty for our present number. We immediately packed up and went over to our new treasure. This spot is 156 miles straight from Ouldabinna. I was greatly pleased at the discovery, though the quantity of water was so small. Though just at this moment had I brought all my camels, they could, I believe, all have had a good drink; but by the time I could return to the depot, and then get back here, it would be gone and the dam dry. "Sufficient unto the day is the evil thereof," is a maxim that explorers, at all events, must be content with. Our four camels got as much water as they desired, and were hobbled out in most excellent pasturage, there being a great quantity of the purple vetch-plant, which is so nutritious both for horses and camels; it grows on a bright green stalk, and when camels can get it they require very little water. No natives appeared now to be in the immediate neighbourhood; we encamped here, and also shot one or two bronze-wing pigeons that came to water at night.

The following morning we found that the camels had decamped in consequence of having long hobbles allowed them, as we did not think they would ramble from such splendid herbage and water. Alex went after them, but did not return until long after midday; during his absence I was extremely anxious, as if he should be unable to track them and return without them, our case would be almost hopeless, as if camels once get a good start, there is no overtaking them on foot. They are not like horses, which will return themselves to water. Camels know their own powers and their own indepen-

dence. However, he brought them, having had to track them for several miles. Now that I had found this water, I was very undecided what to do; it would be gone before I could return to it, and where I should find any more to the west it was impossible to say—it might be 100 miles, it might be 200 or even 300 miles—and I hesitated for a day what to do, whether to go still further west in search of more, or return at once and chance bringing the whole party here. I was also in a state of great anxiety as to the continuance of the water supply at the depôt. I eventually decided to try a few more miles to the west, to see if the character of the country was in any way inclined to alter, before I returned to the depôt. We went 39 miles beyond the dam, and the only alteration in the country I found to consist of a return to the salt lake system that had ceased for so many miles prior to my reaching the one at which the little dam was situated. At the furthest point we reached, being 195 miles from my depôt, it was upon the shore of another salt lake, and there was no water of any kind to be got; the only horizon that could be seen was about 15 miles distant, and was simply an undulation in the dreary scrub, and was covered with the usual timber in which this region is enveloped, that is to say, a mixture of the *Eucalyptus dumosa, Casuarinas*, a few *Grevillea*, pakea-bushes, and leguminous trees and shrubs, such as mulga and a kind of silver wattle-bush, from the latter order of which trees and plants the camels find their sustenance; two stunted specimens of the native orange tree (*Capparis*), were seen where I left the two casks, at 90 miles from the depôt. A profusion of the beautiful desert pea (*Clianthus dampieri*) was, for the first time upon this expedition, found growing in the neighbourhood of the little dam. From my farthest point west, in lat. 29° 15′, and long. 128° 3′ 30″, I returned to the dam, and found that even during my short absence of three and a half days the diminution of the volume of water in the dam was amazing, and I was perfectly staggered at the decrease, as it was at the rate of more than an inch per day. The dimensions of this singular little dam were very small, the depth was the most gratifying feature about it; it was, of course (as all native water places are), funnel-shaped, and to the bottom of the funnel I could poke a stick about 3 feet; but most of that depth was mud, the surface was not more than 8 feet long by 3 feet wide; its shape was elliptical; it was by no means full, having shrunk at least 3 feet from its highest water-mark. I now decided to return by a new route to the depôt, hoping to find some other waters on the way. The last night we camped here was exceedingly cold, the thermometer falling to 26° at sunrise on the morning of the 16th of August; and on that day

we left the dam on our homeward course, and, steering south-east, we came out of the scrubs (which had been thinning) on to a plain in 49 or 50 miles. We skirted along this plain east for 25 miles, and then turned E.N.E. for 106 miles, when we reached our old track from Youldeh to Ouldabinna, having been turned from a straighter course by a large salt lake, which most probably is the southern end of the one we met first, at 18 miles west from Ouldabinna. On the 22nd of August, having camped 15 miles from home, soon after starting it became very cloudy and threatened rain; the weather for the last six days had been intolerable, the thermometer standing at 92° and 94° every day when we had outspanned, and which was not the hottest time of day either. As we approached the depôt some slight sprinklings of rain fell on us, and as we got nearer and nearer our anxiety increased to become certain whether our party were yet there or no, and also if our camels, which had now come 196 miles from the dam, could get any water when we did arrive, for we had found none whatever on our return route. On reaching the spot we were pleased to see the fluttering of the canvas habitations, and we were soon welcomed by our friends. I was indeed glad to find the party there, as I had my doubts if they could hold out until my return. They were there certainly; but all the water that existed in all the wells was barely sufficient to give our four camels a drink, there being only a few buckets of water in the whole camp. However, it appeared as though fortune was inclined to favour us, for the light droppings of rain continued, and before night we were obliged to seek the shelter of our tents. I was indeed thankful to heaven for paying me such a long-standing debt. A slight trickling of water commenced to run into the best catching of our wells; and though the rain did not continue long nor fall heavy, yet a sufficiency drained into the receptacle to enable us to fill up all our water-vessels, and give a thorough good drink to all our camels on the following morning. While I was away to the west my two officers, Messrs. Tietkens and Young, had not been idle, as they also had started away at the same time as I did, and had gone to the north. Their first point was to the little native dam they had seen previous to discovering this place, and where they encamped the first night, it being 10 miles N. 9° E. from here (Ouldabinna). Leaving it they went north for 25 miles, over high sandhills and through scrubs, when they saw some fresh native tracks, and discovered a small and poor native well—there being only a bucket or two of water to be got out of it. They kept on, still going further north for 25 miles, when they found a hollow with natives' tracks in it, and

some diamond birds, but were unsuccessful in all their searches for water. Going further north for 15 miles they observed some smoke to the north-east, and reached the place in 6 or 7 miles. Here they found and surprised a large family of natives who had apparently only recently arrived also. Here a wide and deep hollow or valley existed amongst otherwise a high sandhill country, timbered mostly with a kind of *Eucalyptus* which is simply a gigantic species of mallee—but as it grows singly and not in bunches, it resembles gum-trees. Having descended into this hollow, which is a mile and a half wide, and having seen the natives there, they were in hopes of gaining some information from these persons; but, unfortunately, the whole mass of them decamped, uttering loud and prolonged cries. Following this most peculiar valley still northwards, they reached its head in about 6 miles, but could discover no place where the natives obtained their supplies of water. At this point they travelled over burnt sandhill scrubby country still north, 4 miles further, when the natives that before had appeared so shy now came running after them in great numbers, in the most threatening manner, howling at and annoying them in every possible way. These people were now arrayed in their war-paint, and had all their fighting weapons in hand, and evidently meant mischief: but they managed to part from them without coming to a hostile encounter. They endeavoured to parley with them, and stopped for that purpose, but could gain no information whatever as to the waters which existed in their territory. Another 4 miles was travelled north, over burnt country; and, having failed in discovering any places, or even signs of places (otherwise than the presence of black men), where water could be obtained, and being anxious as to the state of the water supply at the depôt—as I had advised them not to remain too long away—from this point, whose position is in lat. 27° 48′ 5″, and long. 131° 19′ 8″, they returned, though they were aware that the great Musgrave chain was not more than 100 miles to the north of them; but they had not yet sighted it. They were greatly disappointed at having been so unsuccessful, and returned on a slightly different route, searching every likely-looking place for water, but none appeared to exist, though they are both of opinion that the country is watered by native wells; and had they had sufficient time to have more thoroughly investigated it, they would doubtless have been successful.

When I returned with Alec Ross from the west they had returned some days; and they were most anxious to hear how I had got on out west. Saleh also had returned by himself all right; and the only anxiety now at the camp was, as usual, the

question of water supply. I had found so little where I had been, and the water here had been failing steadily every day, that had I not returned when I did, in another day I might have found the place deserted, and all the wells dry.

Now, however, we had got our present stock replenished by the light rain, and, for the present, all was well; but it did not follow as a sequence because it rained here that it must also rain at the little dam, 160 miles away. But yet I decided to take the whole party off to it; and as we had now a sufficiency of water for the purpose, to carry as much as we possibly could, and if no rain had fallen at the dam when we got there, we should have to give the camels what water they carried, and keep pushing on west, and trust to fate, or fortune, or chance, or Providence, or whatever it might be that brought us to more water. So, the day after I returned, we filled up everything we had that could hold water; and on Tuesday, the 24th of August, we finally departed from this little depôt, having 160 miles of desert for certain without water, and perhaps none at the end of it. But having watered our camels and filled our bottles, we "folded our tents like the Arabs, and as silently stole away."

In consequence of having to carry so much water, our loads upon leaving Ouldabinna were enormously heavy, and the weather became annoyingly hot just as we commenced our journey. The four camels Alec Ross and I had out with us looked wretched beside their more fortunate companions that had been spelling at Ouldabinna, and which were now in most excellent condition, while our unfortunates had been travelling for seventeen days, at the rate of 23 miles per day, with only one drink of water in the interval. These four I took were certainly most excellent creatures. We had been travelling for six days from Ouldabinna, and were very well on our way towards the little dam, having come 120 miles, the days having been very hot and oppressive. At dusk of the sixth day, some clouds obscured the sky, and light rain fell, which continued 'till the morning of the seventh day, which was August 30th. I was more gratified than ever with heaven for this partial payment, for now I felt sure we should find in the little dam more water than when I left it. On the morning of the 30th more rain fell, and there was every appearance of a good wet day setting in, so we quietly camped in the scrubs, and enjoyed it amazingly under our canvas roofs, and made ourselves as happy and comfortable as we could in the distressing circumstances in which we were placed. The ground was far too porous to hold any surface water, and had the camels wanted it ever so much, it could only be caught on the canvas; and what with the rain,

and what we carried, and what we caught, we could give them as much as they wanted to drink, as I was now sure of getting more in the little dam when we reached it. During the night of the 29th one of our cow camels calved, and, unfortunately, the animal strained herself so severely in one of her hind legs that she could never rise from the ground. She seemed also paralysed with cold—her little cow calf had to be killed—we milked her as well as we could whilst she was lying down, and we fed and watered her—at least, we offered her food and water, but she was in too great pain to eat. After delaying an additional day here on her account, and all efforts to raise her proving unsuccessful, I could not leave the poor brute on the ground to die by inches slowly by famine, so I in mercy shot her just before we left this place, and she lay dead alongside the calf that she had brought to life in such a wilderness only at the expense of her own. This cow had been one of our best riding camels, and was Mr. Tietkens's hack. We had now little over 40 miles to go to reach the dam, and all our water being drunk, the loads were now light enough. We reached the little dam on the 3rd of September, and were delighted to find that it had not only been replenished, but had become full to overflowing, and a little water was actually visible in the bed of the lake alongside of it, but only at the southern end; but it was undrinkable. The little dam had now 6 feet of water in it, and there was ample for all my expected requirements; the camels could drink at their ease and pleasure, and the herbage was more green and luxurious than ever—there was the purple vetch and numerous leguminous bushes that camels are so fond of, besides quantities of the beautiful desert pea, which they ate with great avidity. Mr. Young told me he saw two or three natives where we pitched our encampment, but I did not see them, and they never returned while we remained in possession of their dam. I stayed at this very agreeable little place for a week to recruit the camels, and more particularly to enable another cow camel to calve; during this interval, we had continued oppressive weather, the thermometer usually standing at 92°, 94°, and 96° every afternoon, but the nights were agreeably cold. We had generally very cloudy mornings; the flies were particularly numerous and troublesome, and I began to conclude that any further travel to the west would be done under very unfavourable circumstances. We had now been, for 7½° longitude, that is to say, 450 miles of westing, and 130 miles of northing, and occupying the intervening period, from the 9th of June to the 3rd of September, entirely enveloped in dense scrubs; and I may take upon myself to say that very few people ever had such a country to traverse previously. I have managed to

penetrate it up to this point—the little dam being situated in lat. 29° 19′ 4″, and long. 128° 38′ 16″, showing we have crossed the boundary line between the two colonies of South and Western Australia, which is the 129th meridian. It appeared evident to me, that in such a country as I now had got into, having traversed nothing but scrubs for hundreds of miles from the east, and having found no water of any size whatever in it, I say it appeared evident (arguing by analogy) that no water really existed in it, except an occasional native well or native dam. Concluding such to be the case, and our object being that the expedition should reach the City of Perth, I decided that there was only one way to accomplish it, and that was simply to go there haphazard at any risk, and trust to Providence or chance for an occasional supply of water here and there in the intermediate distance. I was able to carry a good supply of water in casks, water-beds, and bags; and to enable me to carry the water, I had done away with various articles. and made the loads as light as possible; but it was merely lightening them of one commodity to increase them with a corresponding weight of water. At the end of a week I was tired of the listless life at the camp. The cow camel had not calved, and showed no greater disposition to do so than when she arrived, so I determined to delay no longer on her account. The animals had done remarkably well here, as the feed was so excellent. What water had been lying in the bed of the lake when we arrived had now entirely dried up; and the quantity of water taken by the camels and ourselves from the little dam was beginning to tell considerably upon it, plainly intimating to us that it was by no means inexhaustible, and that for the sustenance of life more must be found. Where the next favoured spot would be was more than tongue could tell. The last water we had met was over 150 miles away; the next might be double that distance. The only way to find out that riddle was by going to see. Having digested all these matters to myself, I consulted my officers and men, and I determined on leaving here to push on until we did get water. We were on the worst desert probably upon the face of the earth; but that thought only gave me the more pleasure in conquering it. We were surrounded on all sides by dense scrubs, and the sooner we pushed our way out of them the better. The natives belonging to this little dam had never come near us, and therefore we had got no information from them concerning any other waters, though it is highly probable all I should have got would have been valueless. This region evidently does not support many of them, and there is not, so to say, any game whatever on it. I never before saw any part of Australia so devoid of animal life.

As before mentioned, I remained at this welcome little spot for a week, and then I departed, leaving it on Friday, 16th September. The morning we left was cloudy and cool, and I anticipated a change from the quite sufficiently hot weather we had lately had, though I did not expect any rain. We had no conception how far we might have to go, nor how many days it would be, before we might next come to water; but we left our friendly little dam in high hope and excellent spirits, as we also hoped, as well as water, to discover some more agreeable geographical features than had yet fallen to our lot. I had set my own and all my party's lives upon the cast, and will run the hazard of the die; and I may say that each person at starting into the unknown displayed the greatest desire and eagerness for our attempt.

On leaving the dam I had determined to travel upon such a course as would enable me to reach the 30th parallel of latitude at its intersection by the 125th meridian of east longitude, as I thought it probable the scrubs would terminate sooner in that direction than in one further north. Our course was now on a bearing of S. 76° W. (which left the line of salt lakes Alec Ross and I had formerly visited, and which lay nearly west to our right, or northward of us). Immediately on leaving the dam we entered thick scrubs as usual; they were mostly composed of the black oak (casuarina) with sandalwood and mulga. We passed by the edge of two small salt depressions at 6 and 9 miles. At 10 miles we were overtaken by a shower of rain, which induced me to encamp at 11 miles, upon another small salt lake. During the evening some slight showers fell, and we saved sufficient water, by means of our tarpaulins, for all our requirements for the day, so that our original stock of water that we carried was untouched. At dusk more rain fell, and continued the greater part of the night. We were thus enabled to fill a large canvas trough, which I always carried for watering the camels, and which held a sufficient quantity of water for all of them to drink. On the following morning, however, none of the camels would look at it, as they had so lately come from the dam, and as they probably had imbibed sufficient fluid through their pelts to moisten their clay during the night. So, as all our water-carrying vessels were full, the troughful had to be poured out upon the ground. We did not start till 12 o'clock that day; and at 11 miles on our course, after passing two small salt lagoons, we came upon a much larger one, where there was excellent herbage, and the recent rains had left several sheets of water in the bed of the lake in various places, but they were all as salt as brine, in fact, it was brine itself. The country which we passed to-day was

all scrub, and nothing could be seen a-head, or, indeed, in any other direction. The latitude of the camp upon this lake was 29° 24′ 8″, and it was 22 miles from the dam. We now continued our march, and proceeded on still upon the same course; by the fifth day of our travels we had met with no water or places to hold it, and had left all the salt-lake basins behind. Up to this point we had been continually in the dense scrubs, but here the country became a little more open. Myal timber generally took the places of the mallee and casuarinas; the spinifex had disappeared, and real grass grew in its place, and I was in hopes of finding some water if we should debouch upon a plain, or perhaps discover some ranges or hills which the scrubs had hidden from us. On the sixth day we entered fairly upon a plain, the country being very well grassed, and it had several kinds of salsolaceous bushes upon it, though the soil was not very good; it was very hard and good travelling country, the camels made scarcely any impression upon it, and only by the crushed grass could the trail be followed—no one could trail us after leaving the scrubs and the softer soil, or sand, which they inhabit. The plains appeared to extend for some distance. On them we saw one or two wild turkeys, only one of which could we get—Mr. Young just managed to wing one, on the seventh day from the dam; on the morning of the eighth day, we actually had cold fowl for breakfast, with a modicum of cold water. On the ninth and tenth days of our march the plains continued, and I began to think we were more liable to death from want of water on them than in the dense scrub we had been so anxious to leave behind. Though the country was now all plains, yet no view of any extent could be got, as the country still rolled on in continued undulations in the same way it had done in the scrub. It was evident the region we had entered was utterly waterless; and in all the distance we had come in ten days no spot had been found where it could lodge. It was totally uninhabited both by man or animal; not a track of a single marsupial, emu, or wild dog was to be seen, and it seems we had penetrated into a region utterly unknown to man and as utterly forgotten by God. We had now come 190 miles from water, and our prospects of obtaining any appeared to get less and less. On the eleventh day the plains died off again, and we re-entered a new bed of scrubs, consisting again of mallee, casuarinas, sandal-wood, and quandong trees, and the ground overgrown with spinifex. By the night of the twelfth day from the little dam (having daily increased our rate of progress), it being the 21st of September, we had traversed scrubs more undulating than previously, consisting as usual of mallee, myal, mulga, casuarina, &c.; and at

sundown we descended into a hollow, which I thought would prove the bed of another salt lake; but upon reaching it I found it to be a rain-water basin or very large claypan, and though there were signs of the former presence of natives, yet the whole basin, grass, and herbage about it, were all as dry as the desert around us. Having found a place where water could lodge, I was certainly disappointed in finding none, as it showed that no rain whatever could have fallen here when we had good but useful showers immediately upon leaving the dam. From the appearance of the vegetation no rains could have visited this spot for many months, not to say years; the grass was white and dry, and ready to blow away with any wind. We had now travelled 242 miles from the little dam, and I thought it advisable here to give our lion-hearted camels one day's respite, and to apportion out amongst them the amount of water that some of them had carried for the purpose. By the time we had reached this distance from the last water—though no one had uttered the word retreat, as every one probably knew it would be useless, yet I was not unassailed by a few croakings from some of the party who strongly advised and wished me, for the sake of saving some of the camels' lives, to sacrifice a certain number of the worst, and not give these unfortunates any water at all. But I represented that it was wrong and unjust to pursue that course and yet expect these neglected ones still to travel with us; as, even in their dejected state, some of them might actually go as far without any water as the others would go with; and as for turning them adrift, or shooting them in a mob, as long as they could travel that was out of the question. So declining all counsel, I declared it should be a case of all sink or all swim; and in the middle of the thirteenth day, during which we rested for the purpose, the water was fairly divided amongst them—the quantity each got was a little over four gallons, and there being 18 grown animals and one foal, the quantity given was about 80 gallons. The position of this dry water-basin is in lat. 30° 7′ 3″ and long. 124° 41′ 2″. We had now passed the intersection of the 30th parallel by the 125th meridian, and since reaching it my course had been five degrees more southerly; and on departing from this wretched basin on the 23rd of September, with animals greatly refreshed, and carrying much lighter loads in consequence of the water being drunk, we continued our course, entering immediately dense scrubs of malleo, with spinifex, black oaks (casuarina), and numerous gigantic mallees like gum-trees. The country rose into sandhills, and a number of the melancholy cypress pines (*callistris*) ornamented both the sandy rises and the spinifex depressions through and over which we went. Some

occasional signs and traces of natives were met, but no water seen, the only water they can possibly obtain in this country must be got from the roots of the trees. A great number of the so-called native poplar-trees, of two varieties, were now met, and the camels ate them as they passed by; the smaller vegetation here assumed the familiar similitude to that which obtains an existence at and around the Mount Olga of my first and last expeditions. Two wild dog puppies were seen in the scrub to-day. My black boy, Tommy, had occasionally found some lowans' (*Leipoa ocellata*) nests, and we had thence obtained a few of the eggs, as this is the laying season; and these, with the turkey Mr. Young had shot, were the only adjuncts to our supplies that we obtained from this region. After this day's stage there was nothing for the camels to eat but the native poplar-tree, and they devoured them with great apparent relish, though to my human taste it is about the most disgusting vegetable I ever put into my mouth. The following day we travelled 26 miles of scrub, and camped in the mallee as usual. The latitude here was 30° 17′. The country continued to rise into sandhills from which the only views obtainable presented spaces precisely similar to those already traversed and left behind us to the eastwards; and if it was only from the experience of the past we were to gather an intelligence of what was before us in the future, then would our future be most gloomy indeed. At 12 o'clock some native fires were seen straight on our course, and a little to the north of it their tracts were somewhat numerous. The day was quite warm enough, the thermometer standing 94° in the shade. On Saturday, 25th September, being the sixteenth day from the water at the boundary dam, we travelled 27 miles, still on our course, through mallee and spinifex, pines, casuarina, mulga, acacias, and quandong-trees, and noticed, for the first time upon this expedition, some very fine specimens of the grass-trees (*Xanthorhœa*). The giant mallee also were very numerous; they give a most extraordinary appearance to the scenes they adorn, as they cheat the eye of the traveller into a belief that he is passing through tracts of alluvial soil, and gazing upon the ever water-indicating gum-trees. This night we reached a most abominable encampment, as there was nothing that the camels could eat, and the ground was entirely covered with great bunches of spinifex; before us and all along the western horizon we had a black and scrubby rise of very high sandhills, and each of us upon observing it noticed its peculiar resemblance to those sandhills which had confronted us to the north and east when at Youldeh. By observation we found we were upon the same latitude as Youldeh, but had reached a point in longitude 500 miles

to the west of it; and it is highly probable that no water exists in a straight line between the two places. Shortly before evening I took the compass and steered in a more southerly direction than Mr. Young, who had been then in advance; this took us over a long white sand-ridge, and brought us to the hollow, where, as I said before, we had such a wretched encampment for the night. I mention this, as a circumstance attaches to it. We had now come 323 miles without having seen a drop of water. Towards the line of dark sandhills, which formed the western horizon, was a great fall of country into a kind of hollow, and Mr. Tietkens, upon the following morning, appeared greatly impressed with the belief that we were in the neighbourhood of some water; but I would not believe it. He started away on foot, a-head of the string of camels, to steer, and gave Tommy his little riding bull—the best leading camel we have—and told Tommy to go on top of a white sandhill to our left (a little south of us), and see if he could find any black tracks or other indications of water. I did not know Tommy had gone at all, nor could I see that Tietkens was walking, as it was quite an extraordinary event when the whole string of camels can be seen at once in this country; and we had gone some 2½ miles when Alec Ross and Nicholls declared they heard Tommy calling out "Water!" but as I never will believe this kind of things until they are proved, I kept the party still going on. However, Tommy came after us, and between a scream and a howl yelled out, now quite loud enough for me to hear, "*Water! water! water!*" when, of course, all turned after him to our left. Soon after he left us, he had ascended the white sandhills Mr. Tietkens had sent him to, and what sight was presented to his view! An open piece of grass-land at half a mile distance, surrounded entirely by pine-trees, and falling into a funnel-shaped hollow. Before ascending the sandhill, he had picked up the tracks of an emu, and, on descending it, he found the tracks went for the open circle he had seen, and followed them along to it where he saw, to his great satisfaction, a small and miniature lake lying in the sand with plenty of that invaluable fluid he had not beheld for more than 300 miles. He watered his camel, and then came after us, as we were slowly passing on to death and doom ignorantly by this life-sustaining prize. Had Mr. Young steered rightly the morning before, we should have had this treasure right upon our course, and had I not checked his incorrect steering we should have passed under the northern side of a long white sandhill more than 2 miles from this water, and neither Tommy nor any one else would have seen the place on which it lies, as it is completely hidden in the scrub; and as it was we should have passed within half a

mile of it, if Mr. Tietkens had not sent Tommy to look out. When I arrived at this newly-discovered liquid gem I found it to be as described above; it is the most singular existing water I have ever seen—lying in a small hollow in the centre of a small grassy flat, surrounded by clumps of the funereal pines.

The water here is, no doubt, permanent, as it is supplied by the drainage of the sandhills surrounding it. It lies exposed to view, in a small open basin, 150 yards round, and 2 to 3 feet deep. Farther up the slopes, native wells had been sunk in all directions, in each and all of which there was water. There was one large well, a natural one I consider, lying 12 or 15 feet higher up than the largest basin, which had a plentiful supply of water in. Beyond the immediate precincts of this open space the scrubs abound. It may be imagined we were gratified at the discovery of this only and lonely watered spot, after traversing such a desert to it. How much longer the expedition could have gone on without water we were now saved the necessity of trying. But this I may truly say, that your South Australian camels are second to none in the world for strength and endurance. In a human and humane point of view, it was certainly most fortunate to have found this spring, and enjoyed both for men and animals a respite from the unceasing march; and as the point for which I desired to make (Mount Churchman) was yet 330 miles distant, it was evident that this discovery was a vast benefit to, if not the entire salvation of, the whole party.

During our march from the little boundary-dam, for seventeen days, though I had not put the members of the party upon any actual short allowance of water, yet the implied restraint upon each was so great that we were all in a continued state of thirst during the whole time; and the small quantity of water consumed (of course we had neither tea nor coffee) showed how all had restrained themselves. Geographical features have been most terribly scarce upon this expedition, and this spring is the first permanent water I have found. I have ventured to dedicate it to the Queen, naming it "Queen Victoria Spring."

On arriving here our camels drank as only thirsty camels can, and our own great delight was to find ourselves enabled to indulge in the luxury of a bath, as we had been seventeen days without a change of apparel, or the slightest attempt at a wash. At this peculiar spring the thorny vegetation of the desert grows alongside the more agreeable water-plants at the water's edge, so that fertility and sterility here stand side by side. Mr. Young here planted the seeds of numerous vegetables, plants, and trees, and amongst others some of the giant bamboo (*Dendroclanus striatus*), also Tasmanian blue gum, and wattles;

though I am afraid they will never reach maturity, as the natives are continually burning the rough grass and spinifex, which on a favourably windy occasion will consume everything green or dry down to the water's edge. There seems to be very little native game here, though a number of bronze-wing pigeons came to the water at night and morning; but there being several small native wells, besides the larger sheet, for them to drink at, and there being also a quantity of a thorny vegetation to screen them, we have not been very successful in getting many—our best shot, Mr. Young, having bagged only four or five. Having found this spring, I determined to give our noble camels a fair respite, as we have yet 330 miles to travel to Mount Churchman, and it is just as highly probable we shall get no water between here and there, as between here and the little dam we have left behind us.

On Saturday, the 2nd of October, we had been resting under the umbrageous foliage of the cypress-vines, amongst which our encampment was fixed for nearly a week, the party and camels had all recovered from the thirst and fatigues of our late march, and it really seemed impossible to believe that such an extent of country as 325 miles could actually have been traversed between this and the last water. The weather during our halt here had been very warm, and yesterday was a most abominable day—a heated tornado blew from the west from morning till night, and continued until the morning of the 2nd of October, when without any otherwise apparent change in the atmosphere, and no clouds, the temperature of the wind became entirely changed, and the 2nd was an exceedingly cool and delightful day. We found the position of this spring to be in lat. 30° 25′ 30″, and long. 123° 21′ 13″. On leaving a depôt and making a start early in the morning, camels, like horses, may not be particularly inclined to fill themselves with water which they might do in the middle of the day, and might thus leave a depôt on a long dry march not half filled. The Arabs in Egypt and other camel-countries, when starting for a desert-march, force the animals (so I have read) to fill up by using bullocks' horns for funnels, and pouring the water down their throats till the creatures are ready to burst; and the animals, knowing by experience as soon as the horns are stuck into their mouths that they are bound for a desert-march, fill up accordingly. Strange to say, though I had brought almost every article that could be mentioned for the journey, yet I did not bring any bullocks' horns, and, consequently, could not, as above described, fill up my camels at starting. So as to obviate any disadvantage on that account, I sent to-day, with Mr. Tietkens and Alec Ross, three camel-loads

of water to deposit about 25 miles on our next route, so that the camels could top-up *en passant.* The water was to be poured into two canvas troughs, and covered with a tarpaulin. After Mr. Tietkens and Alec returned we remained yet two days longer at the Queen's Spring; and before I leave the spot I had perhaps better remark, that to any other traveller it might prove a very difficult (perhaps dangerous) place to attempt to find, as though there are many white sandhills in the neighbourhood, yet the open space on which the water lies is so small in area, and so surrounded by scrubs, that it cannot be seen from any conspicuous one, nor can any conspicuous sandhill (distinguishable at any distance) be seen from it. It lies at or near the south-west end of a mass of white-faced sandhills, there being none to the south or west of it. While we remained here there were a few natives prowling about the camp, but they never showed themselves on the top of the bank. Above the water was a well-beaten corroberrie path, where these denizens of the desert have often held their feasts and dances. Tommy found close by a quantity of long, flat, sword-like weapons, and brought four or five of them up to the camp. They were ornamented (?) after the usual aboriginal fashion—some with slanting cuts or grooves along the blades, others with square, elliptical, and rounded figures. Some of these two-handed swords were 7 feet long. Mr. Young and I collected as many specimens of plants here as we could. Some grass-trees grew in the vicinity of this spring; some of these trees reached a height of 20 feet and over. On the evening of the 5th of October a small snake and several scorpions came crawling about us as we sat round the fire, and we managed to kill the scorpions, but though we wounded the snake, yet it escaped. While at this water we occasionally saw some hawks, crows, corillas, black magpies, which in some parts of the country are also called mutton-birds, and pigeons. One day Peter Nicholls shot a queer kind of carrion-bird, like a crow, only it was not so large though its wings were as long; it had the peculiar dancing hop of the crow when on the ground; its plumage was of a dark slate colour, with whitish tips to the wings; its beak was similar to the crow's. I now desired to go as straight as possible for Mount Churchman, discovered by Gregory in 1846. Its position on the chart is in lat. 29° 58′, and long. 118°, being distant from this depôt 330 miles in a straight line upon the map; but straight lines upon the map and straight lines through dense scrubs are two different things, and, go as straight as we could, we should still make it several miles farther.

On the 6th of October, Wednesday, we departed, and at once entered into the second division of the desert. That night we

reached the place where Mr. Tietkens and Alec Ross had left the two troughs full of water, it being 25 miles about W.N.W. The country was all scrub and sandhills. We saw a few currajing-trees during our day's stage, and where we camped there were a number of well-grown eucalyptus-trees with yellow bark. They appeared to me very much like the yellow-jacket timber of parts of Queensland and New South Wales. The water I had sent out here was just sufficient to fill up the camels. On the following day, just after we started, at 3 miles from camp, we came to some large and rounded granite boulders in the scrubs, but there were no receptacles for holding any water at any time. At 16 miles we reached a dry salt lake on our left hand, which continued near our line for 4 miles. Both yesterday and to-day we saw some native wallaby-traps in the dense scrubs. At 20 miles we sighted a low hill, and reached its foot in 24 miles; there were salt-lake depressions nearly all around us. Here we found a small quantity of good feed for the camels, namely, some of the little pea-vetch, of which all herbivorous animals are so fond. From the summit of this little hill—the first I had met for nearly 700 miles—another low and scrubby range was lying to the westward, and nearly across our course, with salt lakes intervening, and others nearly all round the horizon, though the farthest vision was bounded, except where the low range lay, by dense scrubs as usual; we encamped at the foot of this little hill. A few hundred acres of ground were open, and there were clay-pans on it; but no rain could have fallen here for ages, I should imagine. The hill was about 200 feet high; it was composed of granite stones. I was glad at last to see some granite crop up, as we were now, so to say, approaching the western coast-line formation, which I have always understood to be all granite; and it was time something like a change of country occurred. The day following, in making for the low range, we found ourselves caught in the ramifications of some of the saline depressions, and had therefore to go a long way roundabout to avoid them. Just previous to reaching the low range we came to the shore of another salt lake, having a hard, firm, quartz, pebbly bed, and were enabled to travel across it to the hills, which we reached in 16 miles from last camp. The view from the summit was as discouraging as ever. To the west densely scrubby rises appeared, with many salt arms and channels below them to the south, and all round in every other direction nothing but scrubs and scrubby rises bounded the view. The ridges beyond this low range, which was about 300 feet high, continued in our course, a little north of west, for 2 or 3 miles, when we again entered the sandy scrub, and camped after travelling 28 miles—our position here

being in lat. 30° 10′ 5″, and long. 122° 7′ 6″. The next day we made good 24 miles, all scrubs, sighting three low ranges, northerly, north-easterly, and E.N.E. at 12 miles, the most easterly appearing the highest. They were 20 to 30 miles away from our track.

On the 9th and 10th of October we had all scrubs. On the 11th, towards evening we had some scrubby ridges in front of us, and were again hemmed in by salt-lakes, and, to save several miles of roundabout travelling, we attempted to cross one, which, though not very broad to the west, was exceedingly long to the north and south, and lay right across our track. Unfortunately we got a number of the leading camels into a fearful bog, and had the greatest difficulty in getting them safely out. It was only by the strenuous exertions of all hands, and by pulling up their legs with ropes, and poking tarpaulins into the vacated holes, that we finally got them all out without loss; then we had to carry out all their loads ourselves, and the pack-saddles. We found it no easy matter to carry 200 lbs. (half a load) on our backs through the boggy soil on to the dry shore; however, we were most fortunate in having no loss with the camels, for a camel in a bog is the most helpless creature imaginable. Leaving the bog we started up the shore of the lake northerly, where we found some more of the little pea-vetch, and encamped near the top end of the lake, having travelled nearly 30 miles, but only making 24 straight from last camp. The camels had nothing to eat for three nights previously. We saw some native smoke 3 or 4 miles away from where we camped; and, as there were some ridges near it, I intended to send some one in the morning to look for water. The following day we had got 3 or 4 miles to go round to get clear of this boggy lake; and Alec Ross and Tommy walked across to hunt up any traces of natives, &c., and look for water. On clearing this feature we ascended some densely scrubby granite rises which had some bare rocks exposed here and there, but no indentations for holding a drop of water could be seen. At 15 or 16 miles, having passed all the ridges and entered mallee scrub again, Alec and Tommy overtook us, as Mr. Young had remained behind with camels for them, and reported they had found one small rock-hole—Alec said with 20 or 30 gallons of water in—but Tommy said it was only a little drop, so I did not think it worth while to send any camels back so far for so little reward. We saw two or three dozen grass-trees to-day with quandong and currajing trees. Camping again in the scrub, where there were only a few leguminous bushes for the camels to eat, having travelled 28½ miles, but only making 24 straight. The last three days had been very warm, the thermometer going up to

98° in the shade each day. The camels appeared thirsty, and would not feed well upon what bushes there were for them, which was very poor provender. During the last few days we had met with occasional patches of grassy and clayey ground, generally where the yellow-bark mallee-trees grew, and we passed numerous small clay-channels and pans in which rain-water might lodge for some time after a shower; but it was very evident from the appearance of the grass and vegetation that no rains could have visited this ungodly region for a year at least—every vegetable thing seemed dry, sere, or dead. On the 13th of October, at 12 miles from camp, we passed over some more scrubby granite ranges, and where some extent of bare rock lay exposed. I searched about it, but the indents upon it were so small and shallow that water could not remain more than a week after rains. Mr. Young and Tommy, from their camels' backs, saw another mass of bare rocks further away to the north-west, so I took Tommy and my riding camel and we went over to it while the party went on. On arriving, we found a very pretty piece of scenery—several hundred acres of bare red rocks with grassy flats sloping down from them to the west, and forming little watercourses or flat channels. We saw great numbers of crows, and many fresh natives' tracks, also the smoke of several fires in the surrounding scrub. Tommy took the lower grounds while I searched on the bare, flat, granite rocks. He soon found a small native well in a grassy water-channel, and called out to me; on joining him I found there was very little water to be seen in it, but I thought a supply might be got with a shovel, and I decided to send him back on my camel to bring the party back here. We gave my little riding camel Reche, or, as I usually call her, Screechy, all the water that was in the well; and Tommy started away, while I intended to search all about in his absence for more. When he had gone about 200 yards on his road down the grassy channel he called to me again, and pointed to the ground and said, "Plenty water here; plenty water here;" and the camel would not go past it. I walked down and found a very excellent large native well, with a good body of water, and evidently permanently supplied by the drainage from the mass of bare rocks in its vicinity. I was now greatly pleased at our discovery; and, after giving my little camel a good drink with Tommy's hat, he went off after the party. I remained till they returned. Soon I heard the voices of the natives, and their smokes came gradually nearer. I thought they must have seen me when on top of the rocks, and desired to make my farther acquaintance; it, however, turned out to be only two women coming to the well for water, as they both had vessels for carrying it back to

their encampment. When they came near enough to see me they bolted, and looked at me with their four eyes. I made signs for them to come to the well and drink, but they dropped their bark water-vessels and walked somewhat smartly off; I picked up these things and found them to be of a most original, or rather aboriginal, construction—they being simply a small sheet of the yellow-tree bark, tied up at the ends with a kind of bark-string, and forming a small trough. I was not near enough to distinguish whether they were very beautiful or not, and all I could make out was that one was younger and fatter than the other—the youngest and fattest being the last to decamp. These were the first natives I have seen on this expedition; no other natives appeared while I was by myself. In about four hours the whole party arrived. We soon watered all the camels. They had travelled 6 miles past this place, and therefore had to come 6 miles back again, having travelled in all 202 miles from Queen Victoria Spring. This, in an actual straight line on the map, is only 180 miles. Almost immediately upon the arrival of the party, a number of native men, and one young boy, made their appearance; they were apparently very quiet and inoffensive, and had probably seen white people before. One or two spoke a few English words, as "whitefellow," "what name," "boy," &c. They seemed quite pleased to see the camels drink so much, as they completely emptied the well, which they had probably never seen empty before. The water drained in pretty fast, as in an hour the well was as full as ever, and much purer than formerly. There was plenty of good herbage and bushes here for the camels, and it is altogether a most romantic and pretty little place. The little grassy channels were green and fresh-looking; and the whole space for a mile round is open and dotted with shady acacia-trees and bushes, amongst some of which our camp was pitched. The slope of the whole area is to the west. It reminded me of Wynbring more than any other place I have seen. At first only eight natives made an appearance, and Mr. Young cut up a red handkerchief into as many strips, which were tied around their regal brows, and of which they seemed exceedingly proud. Towards evening three or four more came to the camp, one of whom had a large piece of pearl-oyster shell depending from a string round his neck; another had a queer ornament made of short feathers, likewise worn round the neck—it had the appearance of the mouth of a porte-monnaie; it seemed very curious, and, when we wished to examine it, he popped it over his mouth and opened that extensive feature to its fullest dimensions, laughing most heartily; and at the same time he had a very theatrical air,

and the extraordinary mask *gave* him the appearance of a demon in a pantomime. In taking this ornament off his neck he broke the string, and I supplied him with a piece of elastic band, so that he could put it on and off when he pleased without undoing it; but the extraordinary phenomenon of the extension of a solid was rather more than he was prepared for, and he scarcely liked it to touch his person again; but, as I put it over my head first, it re-assured him, and he wore it again as usual. They seemed a very good-natured lot of fellows, and we gave them a trifle of damper and sugar each. In the morning before we arrived here Tommy had been most successful in obtaining lowans' eggs, and to-day we had eleven or twelve. When the natives saw these, which they, no doubt, considered their own lawful property, they eyed them with great anxiety, expecting probably we should hand them over to them; but we did not do so. The following morning was very cold, indeed, the thermometer having descended to 32° (freezing point), though there was no dew; our sable friends came very early to breakfast, and brought a few more we had not previously seen, also two old and faded frail, if not fair ones. Soon after, a little boy came by himself—this imp of iniquity was just like a little toad, being all mouth and stomach. It appears these natives practise the same rites of incision and circumcision as the Fowler's Bay tribes; and my black boy, who comes from there, said he could understand a few words they spoke, but not all—he was too shy to attempt a conversation with them, but he listened to all they said, and occasionally translated their remarks to us. To-day Alec Ross and Peter Nicholls walked over to their encampment, and said that most of the men that had been over to our camp were sitting there with nothing to eat—the women probably being out on a hunting excursion, whilst they, as lords of the creation, waited quietly at their club till the dinner-hour should be announced. They got very little from me, as I had very little to give away. Nicholls told me they had some tin billies and shear-blades in their camp; and I noticed on two of the first batch we saw that one had a small piece of coarse cloth on, and another a piece of horse's girth webbing. After questioning the most civilised and inquiring about some places with native names marked in Petermann's chart, they knew two or three of them, and they generally pointed in the proper directions. It was very evident they had often seen white people before, if they had never eaten any.

It was rather a cloudy morning (18th) when we left this place —Ularring—which is situated in latitude 29° 35′, and longitude 120° 31′ 4″, rather late in the day, and immediately re-

entered the dense scrubs, which were now more than usually thick. We passed a small salt-lake bed on our right. We made good 20 miles by night, which became cold and windy, and threatened rain. At 3 or 4 miles, on the following morning, we saw some bare granite rocks to the south of our line, and noticed the tops of some low ranges to the north; but which were partially hidden by some nearer ridges, the summit of one of which was a mass of exposed rock, similar in appearance to Ularring, and seemed remarkably high—but being 5 or 6 miles away from our line, which was now nearly west, we did not visit it. At 15 miles from camp, from the top of a scrub undulation, we sighted a pointed hill a little south of west, also another, higher, longer, and more southerly. We could not reach the pointed hill by night. The country is now more densely scrubby than ever, and though we toiled the whole day, we only made good 24 miles. Upon nearing the hill the following day we saw some more of the grass-trees, and passed between two salt lakes. At 10 miles we were upon the top of the hill. The scrubs surrounding it were so terrifically dense that we had the greatest difficulty in getting the caravan to move along at all. Only Mr. Young and I ascended the hill, and I was very much surprised at the view I obtained. In the first place, as we were now so gradually approaching Mount Churchman, the hills to the south were, or should have been, Mount Jackson, but according to the chart I had there was nothing visible in any easterly direction from Mount Jackson, whereas, from the range to the south, not only the hill I was upon, but all the others, in various directions, must also have been seen from it by any one who had ascended it. It was very puzzling, as here we were in a place where there should be no hills, according to Mr. Gregory, and yet we not only stood upon one, but others surrounded us in nearly all directions. The composition of this hill was almost iron itself, and there were also some fused rocks, like volcanic slag, upon it. It was too magnetic for working angles with a compass. It was between 500 and 600 feet above the surrounding country. The horizon, from about E.N.E., round by north and west to south, was bounded by low ranges, detached into seven groups, and the white beds of small lakes were visible, running up to the northern or north-eastern group—the intervening country being all scrubs, and which grew even to the summits of the hills. The view from this hill was enough to horrify the spectator. Another pointed hill lay nearly west, and we pushed on to it, but could not reach it by night. Yesterday and to-day we managed to get a good number of lowans' eggs—yesterday twenty-seven, to day thirty-four; those birds must swarm in

these scrubs, and their eggs form a principal item in the daily fare of the natives during the laying season. We never see the birds, but so long as we get the eggs I suppose we have no great cause to complain. The following morning we reached the second hill, and ascended it. Some more hills, a few miles away, ended nearly west, and some bare granite rocks also appeared a few miles beyond them, and which I determined to visit. This hill was of a similar formation to the last. The far horizon, to the west, being all dense scrub, the Mount Churchman should have been visible. Really the sight of the country visible from these hills is frightful. To the oft-repeated question, "When will the scrubs end?" the only reply can be —"Never until our journey ends also." On descending we pushed on for the large granite rock seen, and which we reached in 12 miles from the east camp. As we approached it we could distinguish a large extent of bare rock, and there was every likelihood of water existing there, as we saw numerous crows and some hawks, and we were soon made aware that there were plenty of natives also, as we soon heard them yelling out when they became aware of our approach. A well was soon found, and our camp fixed at it. The natives were rather numerous here. The well was very shallow, but had a good supply of water in it, and there were a few acres of open ground round the rocks, though the scrubs came as close as they possibly could. This spot is 77 miles from Ularring, and our well is situated at what may be called the north-east end of the rocks; at the south-west end there is another and larger valley, where I saw two native wells. On Sunday, 22nd October, we rested here. The upheaval of the few hills we have lately passed seems to have induced a more vigorous growth of scrubs, for they are now hideous in the extreme. No views to any distance could be obtained from these rocks, as the undulations of scrub occur continuously throughout the desert, so to say, at almost regular intervals of a few miles. We obtained a good many bronze-wing pigeons here, and I called these the Pigeon Rocks. Their position is in latitude 29° 58′ 4″ and longitude 119° 15′ 3″. The day was very warm, the thermometer rising to 100° in the shade, and at night a very squally thunderstorm came up from the west, which agreeably cooled the atmosphere, though no rain fell.

On the 24th October we left the Pigeon Rocks, still steering away nearly west; we travelled 25 miles through the dense scrubs with an occasional break in it, and on which breaks a few well-grown yellow-bark gum-trees were found—the old lame cow following, but reaching the camp some time after us. The day after another 25 miles were made good; and just at

evening we tore through a piece of most horrible scrub or thicket, and arrived at the edge of a cliff which stood perpendicularly over the surrounding country, and which we had to circumnavigate to descend. Right on our course, being in the proper latitude, 26 or 28 miles away, was a small-looking hill, which, being the object I had traversed so many hundreds of miles of desert to reach, I was delighted to recognise as Mount Churchman; the intervening country was filled to overflowing with the densest of scrubs. We encamped at the foot of the cliff. Yesterday and to-day we got several lowans' (or, as the West Australians call them, *Gnows'* eggs)—we got forty-five to-day and thirty yesterday. The following day we hoped to reach Mount Churchman, but the scrubs were so dense that we could not get to it by night, though we travelled continuously for twelve hours. We got only twenty-four lowans' eggs to-day. Last night and to-night we had a slight dew, the first we have had for a long time. Early on the morning of the 27th October, we stood upon the summit of Mount Churchman; and, though no mention whatever is made upon charts of the existence of water there, we found a native well, which soon supplied all our wants. In the afternoon some natives made their appearance; they had evidently been at or belonged to stations, as they told us of a station called Guingham (Mount Singleton) in a north-west direction, where they said a gentleman named Major Cook resided, and that we could reach it in four sleeps; but, as I wished to make down towards Perth, I decided not to go that way. The day was very warm—thermometer being 99° in the shade.

On leaving Mount Churchman on the following day, our friendly natives all came and camped with us at night; our course was nearly south-west, and we only travelled 11 miles. The following day our friends departed, as they said, to visit Guingham; we pursued our own course, and reached the shores of Lake Moore. In about 30 miles we found some rock waterholes, and encamped on the edge of the lake. The following day we crossed its bed, which is 7 miles wide; it is a salt lake, but the bed where I crossed it was dry. We left it on the 30th October, and travelling on a course nearly w.s.w. We struck some old dray-tracks at a dried-up spring on November 3rd, which, however, ran eastwards, which was in a direction I did not desire to go. From here I turned to the south, and early on November 4th we dropped down upon an out sheep-station, where there was a shepherd living. This was the first settlement seen in Western Australia, and here we saw the first white man, who was so surprised at the appearance of the caravan that I am sure he would have galloped away, had his horse not

been completely fascinated by the sight of the camels. However we soon assured him we were not denizens of another sphere; and he then welcomed us in the name of the whole Colony. He then went and found the shepherd, who came with his flock, and we very soon had an excellent meal of capital mutton. Here exploring was at an end; roads led to and from all the other settled districts, and we were again in the neighbourhood of civilisation. This out-station belongs to the Messrs. Clunes Brothers, who live lower down the country. On the 6th November we reached Mr. Clarke's homestead, called Inderu, where we were treated with the greatest kindness by every member of his family. Here we were also met by young Mr. Lefroy, son of the Hon. A. O'G. Lefroy, acting Colonial Secretary for the Colony, and who took us off to his station, where we remained some days, thoroughly enjoying a recruiting at so agreeable a place. Our next reception was at the Benedictine Monastery and Home for Natives. Here was the first telegraph station we had reached, and I received a number of congratulatory telegrams from most of the leading gentlemen in Perth; from his Excellency the Governor's Private Secretary, the Press, and from my brother explorer, Mr. John Forrest.

In concluding the tale of a long exploration, a few remarks are perhaps necessary. In the first place, I travelled during the expedition 2500 miles, and unfortunately no areas of country available for settlement were found. The explorer does not make the country, he must take it as he finds it; and though to the discoverer of the finest regions the greatest applause is awarded, yet it should be borne in mind that the difficulties of traversing such a country cannot be nearly so great as those which confront the less fortunate traveller, who finds himself surrounded by heartless deserts. Still, the successful penetration of such a region has its value, both in a commercial and scientific sense, as it points out to the future emigrant or settler those portions of our continent which he should most shun.

It never could have entered into any one's calculations that throughout a distance of more than 1000 miles, in a straight line, the expedition would have to bore its way, "like moles in the earth," through interminable scrubs, with nothing to view and less to cheer. The labours of the exploration ended only at the sea at Fremantle—the seaport of the West; and after travelling under those trees for months from eastern lands through a region accursed, we were greeted at last by the roar of the ocean.

The officers (Mr. Tietkens and Mr. Young) and all the other

members of the expedition acted in every way so as to give me satisfaction, and when I say that the *personnel* of the expedition behaved as well as the camels, I cannot give any greater praise.

XIII.—*Geography of Perak and Salangore, and a brief Sketch of some of the adjacent Malay States.* By W. BARRINGTON D'ALMEIDA, F.R.G.S.

THE kingdom of Perak lies between 4° and 6° N. lat. For its northern boundary it has the Krean River, which until lately separated it from Province Wellesley. At the south, the Bernam River divides it from the neighbouring Malay State of Salangore. To the east we have the Malayan chain of mountains which, like a backbone, runs through the middle of the peninsula, separating it from Tringanu and Pahang; and on the west its coast-line of 130 miles is washed by the Straits of Malacca. The portion of Perak best known to us, at present, is an oblong strip of country hemmed in by the Perak River on two sides and by the sea and the Krean River on the other. This slip of country is said by the late Mr. Birch to cover an area of from 2000 to 3000 square miles. A bird's-eye view of it, from somewhere above the Island of Pangkore, would give a panorama of the loveliest description; extending to the north, east, and west, you would see a landscape varied with forests of primeval jungle, smiling valleys, teeming with the richest produce, and watered by innumerable streams. As the eye gets gradually accustomed to this picture, some of the leading features begin to be defined. First, you would be struck with the great river of Perak, running south, east, and north; then the eye would rest on a chain of mountains, situated at the north-east of this strip of country, stretching beyond the Krean River in the north and almost touching the Bruas River in the south. In this chain of mountain, known as the Laroot Range, you would perceive three conspicuous elevations, standing almost at equal distance from each other: they are the three principal mountains on this side of the Perak River, and are known to the natives as the Gunong Hijau, or Green Mountain; Gunong Pondok, or Shark's Tooth; and the Gunong Buboo, or Wild Man Mountain. The famous tin-mines of Laroot are found in this neighbourhood, and the sides of these mountains are covered with tall jungle-trees, some of them remarkable for their durability and well suited for shipping and building purposes.

The next feature to be observed in the landscape are the numerous rivers which flow at right angles with the great Perak River. Some of them appear to take their rise from the mountain-chain just mentioned, while others will be found to be fed directly from the Perak River. The most important of these are the Krean, the Kurow, the Laroot, and the Bruas. They are also at equal distance from each other, and, besides draining and irrigating the district through which they flow, they serve —in a land where roads have yet to be introduced—as the only channels of communication between the interior and the sea, for the transport of tin, timber, and the other produce of the country.

Attention would, in the next place, be directed to the strip of land which was ceded to us as far back as 1826, and the boundary of which was rectified under Sir A. Clarke, by the Treaty of Pangkore. Its boundaries, according to a clause in that treaty, begin at Bukit or Sagari Hill, above the Bruas River, in a straight line on to the sea: thence south to Pulo Katta: and from this point the line continues about 5 miles north-east into the country; and thence direct north to Bukit Sagari. It has a depth of about 5 miles from the coast, and is said to be well suited for sugar-growing and to be rich in tin. It is watered by two large streams, the Bruas and the Dinding. The latter runs right into the centre of this strip of land, and is described as an extensive lagoon, well sheltered from the sea-coast by a chain of the Dinding Mountains, and, though rather shallow at the entrance, is of great depth within, where large vessels may ride in perfect safety. Foreigners whom I have come across in my excursions in the East have always praised the foresight which Englishmen have always displayed, in selecting spots for colonisation or mercantile enterprise; they always contrive, say they, to secure two very important requirements: 1st, a good anchorage, and, 2ndly, a site well adapted for attack and defence. In this respect we have been most fortunate in the selection made by the Hon. Robert Fullerton, Governor of Prince of Wales Island, in 1826, or, perhaps to speak more correctly, by Captain James Low, the Government Political Agent at that time; for the Dinding River and the Straits of Pangkore afford us all the anchorage we can desire, while the Island of Pangkore, flanked as it is in the north by Penang, and by Singapore in the south, would in the event of a war prove as important to us as Malta to either Gibraltar or Aden. And now before touching on Perak proper and its great river, let me draw your attention for a moment to the district of Laroot, noted for its tin-mines, and, until lately, as the seat of plunder, arson, and murder. In fact, it was spoken of in the East as the "huge cockpit of slaughter,"

where faction fights were constantly going on between the Chinese miners themselves and between the Malays. This called for the interference of the Governor of the Straits Settlements, who, by placing an Assistant Resident at Laroot, and a Resident (the late Mr. Birch) at Perak, restored order and peace to the community. It has been successively visited by Sir A. Clarke, the late Governor; by Mr. Braddell, the Attorney-General for Singapore; by the late Mr. Birch, the Colonial Secretary, and Mr. Irving, the Assistant Colonial Secretary for the Straits Settlements, and other officials; also before and after the outbreak of the war, by the present Governor, Sir W. Jervoise, and a Correspondent of the 'Penang Gazette,' in company with the Buffs, and from their reports, correspondence, and speeches, I gather the following.

Laroot is a district of the kingdom of Perak, lying between the Krean, the Perak, and Bruas Rivers on the land side, and the Straits of Malacca on the west. It takes its name from the River Laroot which, rising in the neighbourhood of Gunong Hijau in the Laroot Range, falls into the sea about 28 miles to the south of the Krean River. "Compared with other rivers on the coast," says Mr. Irving, "it is an inconsiderable stream, as the range of mountains which forms the watershed of the peninsula, at this place, approaches the coast. The Colonial steamer *Pluto*, drawing only 6 feet of water, was not able to do more than enter the river; but the small steamers belonging to the Tunku Mantrie, or headman, are able to get up to the town, a distance of 2 miles from the coast." The town in 1872 was surrounded with stockaded positions, and Mr. Irving observed that there was an excellent road all the way to the mines in the Laroot Range, about 10 miles from the town. The coast of Laroot between the Kurow and the Jurôm Mas (or Gold Needle) River, is a perfect network of rivers and rivulets, and indented by endless creeks and bays, which afford countless sheltering-places for pirates. Most of these creeks and inlets have been explored by the boats of the *Thalia* and the *Midge*, when in search for pirates in 1872, under Captain Woolcombe.

The physical aspect of the district is thus described by Mr. Birch:—"From the sea-shore to some 20 miles inland, Laroot is a great level; here it begins to rise in uplands until it reaches a mountain-range rising to an altitude of some 3000 feet above the level of the sea. This level or plain is well watered and well suited for the cultivation of sugar, tapioca, tobacco, &c. Rice is the only cereal now cultivated. The whole of the land, comprising a strip of about 50 miles long by 6 miles broad, along the base of the Laroot Range, is more or less stanniferous, and the supply of tin is inexhaustible. At present (1872) about 4

square miles are occupied for mining purposes, and there are 120 mines open. Of the Laroot Range, Gunong Buboo, or the 'Wild Man,' is said to be the loftiest. Its slopes are clothed with a dense forest of jungle-trees, some of which are highly valued in a commercial point of view, and which I shall mention at the close of this paper. As yet no native appears to have ascended to its summit, from a superstitious dread that the Gins, who are supposed to dwell in that locality, should take it into their heads to 'distil him into a jelly,' as Horatio says, or 'resolve' him, as dealers of spirits might say, into a mountain 'dew,' so that we shall have to wait until the aspiring curiosity of some Englishman is put to the test before we can give the exact height of this wild man."

As Mr. Birch informs us, however, that the Laroot Range of mountains rises to an altitude of some 3000 feet above sea-level, we may assume that the Buboo is considerably above this elevation, as it is said to be the most conspicuous landmark to mariners beating up the Straits for the mouth of the Perak River, which, as seen on the map, is several miles south of this mountain. The mountains of this range are composed principally of granitic rock, and their slopes are admirably adapted for the growth of the chinchona, vanille, coffee, tea, nutmeg, and cloves.

Between the Gunong Pondok and a hill called Bukit Gantang (or Measure Hill), rises a river called the Kangsa, flowing westwards between mountain, hill, and valley to the village of Qualla Kangsa, being fed in its course by the mountain-streams, the Papin and the Lawin, or probably Lawan (meaning a turbulent stream).

The distance from Qualla Kangsa to the town of Laroot is about 27 to 30 miles. This tract of country between the west of the Laroot Range and Qualla Kangsa was visited in February, 1874, after the signing of the Pangkore Treaty, by Messrs. Swettenham and Pickering, and Captain Dunlop, in their mission to release the Chinese who had been kept in slavery for debt by the Malay Chiefs. They traversed it by means of elephants, and by boats on the Kangsa River, and before the outbreak of the war, Sir William Jervoise and Staff, in paying an official visit to the Chiefs on the Perak River, proceeded by the same route. They describe this neighbourhood as "a rich and fertile country, surrounded with beautiful scenery, and well adapted for the cultivation of tea, coffee, and tobacco." The soil is described as being that of a thick alluvial deposit, the climate as extremely healthy, and the temperature from 65° to 86° Fahr. From the special correspondent of the 'Penang Gazette,' who accompanied the Buffs on their route from Laroot to Qualla

Kangsa, we have a very graphic account of this district. His letter is dated December 2, 1875, from Bukit Gantang, which is a hill between Gunong Pondok and Gunong Buboo, and about 6 or 7 miles from Laroot.

"The country," he says, "is very beautiful; the jungle has been partially cleared away all the way from Simpang to here, and there are some charming bits of scenery along the road. The town of Bukit Gantang is very prettily situated, lying snugly at the bottom of a hill which on the southern side rises over 2000 feet. It has a very respectable bazaar, considering its seclusion and proximity to the turbulent chiefs. Up to this the roads have been excellent, and thanks to Captain Speedy, who is indefatigable in his exertions, and energetic in his measures, the troops have got thus far with the greatest ease and comfort. Beyond this the road is heavy. The Gantang Hills are covered with splendid timber, and the slopes could easily be cleared in the Ceylon fashion for the cultivation of coffee. Not only are minerals to be found in abundance here, but tea, coffee, and tobacco might be grown in large quantities and of the finest quality. I saw specimens of the two latter grown at Simpang Tiga without special care and simply as an experiment, and they were of a very fine quality. One drawback to Bukit Gantang is that it rains every afternoon from year's end to year's end, and I may add it is the happy hunting-ground of mosquitoes. On the other side of Gantang, a considerable quantity of paddy is grown. After leaving it for some distance we reach the entrance of the mountain-pass; the scenery here is very beautiful. The road winds along one of the slopes, and all around rises a magnificent primeval forest, some of the trees being over 150 feet high with clean, stately stems. Beyond this road, there is no possibility of proceeding; elephants alone can break through the jungle and wade the swamps. It was fortunate the Malays did not defend this pass, for a few hundreds of them lying in ambush might have done an amount of mischief unpleasant to think of. In the middle of the pass is a stockade occupied by a few policemen. It was strongly placed, and would have been difficult of assault. Close to the stockade is Gunong Pondok, the Shark's Tooth, a curious mountain, some thousands of feet high, and formed of limestone and saltpetre. It is apparently inaccessible, the sides falling sheer down. In one of its cavernous clifts I saw some long stalactites hanging down in various forms from the roof. The village of Pondok is about 2 miles from the stockade, lying at the south-eastern mouth of the pass. The country all about here is level and thickly covered with low jungle. Nine miles beyond this is Qualla Kangsa."

Gunong Pondok, I may add, was selected by two Malay Rajahs as their (what is very happily termed) "squeezing station:" here on its slopes they built a house, and backed by a band of unscrupulous followers they became a terror of the neighbourhood by levying black-mail on all the passers-by. One of Mr. Birch's first acts, after the signing of the Pangkore Treaty, was to dislodge these ruffians, and this was the cause of the enmity towards him which finally ended in his murder.

The district of Laroot is governed by a headman, called the Tunku Mantrie, who was appointed to this office by the late Sultan of Perak; but so powerless had the present Sultan become, that, but for the interference of Sir A. Clarke, he would have declared himself independent of his suzerain. When Mr. Irving visited Laroot in 1872, he found that the Mantrie had two steamers with which he traded with Penang, and that the control of the trade of Laroot was entirely in his hands. He levied an export duty on tin of $19 a *bhara;** and as the export to Penang at that time was at the rate of about 800 bharas a month, he was then making a fine revenue from this source alone of $182,000, or 45,100*l.* per annum.

Perak proper, or the Silver State, is so called from the river bearing that name. It comprises all that land extending from the Bruas River to the Bernam, and all the land east of the Perak River extending to the confines of Tringanu and Pahang. Its inland depth from the coast is said to be from 180 to 200 miles, and though we are not as yet much acquainted with the districts east of its great river, I am glad to be able to give some reliable information from official sources regarding the river of Perak and the country lying to the west of it, and that adjacent to its banks.

The general aspect of Perak is that of a well-watered and mountainous country. As usual with countries in the Tropics, the tracts of land near the sea are low and marshy, with a dense and tangled forest of mangroves and nipas; beyond this is a succession of mountain chains, culminating in the Gunong Buboo, which is clothed with a dense forest, and seen distinctly from the sea. Throughout Perak the soil of the lower country and low hills is composed of sand mingled with decomposed vegetable matter. It is the most extensive and the richest in natural resources of all the independent Malay States, and the whole country, besides abounding in tin, is rich in iron, lead, saltpetre, slates, and marble. Its climate is salubrious, and the temperature, though hot along the coast, is cool and agreeable in the interior.

* About 400 lbs.

The great feature of the country is the Perak River. It rises north of the Krean River, and beyond the southern boundary of the kingdom of Quedah. It empties itself into the sea a little north of 4° N. lat., and its course from the sea into the interior is thus described by Mr. Birch:—"It extends inland about 30 or 40 miles, and then, after doubling back for about 100 miles, stretches north, keeping up a very tortuous course, but parallel with the coast, and 20 miles distant from it. It is fed from the interior by several tributaries, which drain the slopes from the central range of mountains forming the backbone of the peninsula." Mr. Birch explored this river, to a distance of about 200 miles from its mouth, and nearly all its tributaries. The land along the principal river and its tributaries he found well adapted for agriculture, and throughout the country the natives cultivated Indian corn, coffee, &c., and especially tobacco in Upper Perak. He estimated the population along the banks of the Perak at 10,000, and on its tributaries he conjectured it to be from 20,000 to 30,000. I fear some error has crept into these figures, for I find in a speech made by Sir A. Clarke, in 1874, before the Legislative Council, at Singapore, that the population of Perak, which was given in 1861 as at 50,000, was not more, if so many as 25,000 in 1874. However, to go on. These people, he informs us, live on the very edge of the river, some of them in houses supported by four poles stuck into the bed of the river, and others on its banks in houses concealed in a forest of fruit and jungle trees. The houses are built of wood and are thatched with the dried leaf of the nipa, known as the attap by the natives. Mr. Birch, in one of his last speeches made at Singapore, speaks further about this river in these terms:—"The river is a very magnificent one. At least 150 miles from the mouth, it is over 400 feet wide, and, as the tidal influence extends a very short distance from its mouth, it may be well imagined what rich and fertile lands are to be found along its valley. The greatest resources of this fine district lie in its soil. If any capitalist can be induced along the valley of the Perak River to undertake the cultivation of tobacco, of sugar, or indigo, he will very soon prove the success with which he can work. The climate is excellent, the water pure and in abundance, and very easily available for purposes of irrigation; the soil is remarkably rich, with large herds of cattle at every village, and consequently affording great facilities for enriching the land; while on the mountains around, which are very accessible, good coffee land may undoubtedly be found. Ceylon has progressed of late years with astonishing rapidity, for during the last twenty-five years its revenue has much more than doubled; and yet Ceylon has

not in it the wonderful resources in minerals and in land, and the extraordinary facilities for obtaining water, that the States of the Malay Peninsula possess within themselves." The river, he further adds, is navigable for gunboats 40 or 50 miles from its mouth. Mr. Birch noticed along the banks of this and the other rivers a system of robbery practised by the Chiefs on their subjects, like that of the old Barons who dwelt on the Danube and the castled Rhine. "Every Rajah," says he, "has his squeezing station, where he levies black-mail on trading-boats and articles of merchandise going up and down the river." Can it be wondered at, after this, that the Malays were driven to piracy and plunder?

From Mr. Swettenham, Assistant Resident at Salangore, and Mr. G. B. Elliott, who is also, I believe, officially connected, we have a further account of this fine river:—"It stretches inland," say they, "at right angles to the sea, with a slant northwards for about 40 or 50 miles to a place called Durian Sabatang, where Sultan Abdullah, the present Sultan, lives on the left bank. Here it turns away north, and runs parallel with the sea-coast for 100 miles to Qualla Kangsa (which is 30 miles from the Laroot River). About 4 or 5 miles from Durian Sabatang is Banda Bahru, where the British Residency is fixed, and about the same distance higher up is Passir Salah, where Mr. Birch met his sad end; and 30 or 40 miles higher we come to Blanja, where ex-Sultan Ismail lived, and who, it will be remembered, was instrumental in Mr. Birch's murder, and who was given up by the Sultan of Quedah, on the 20th of last March, after giving the British forces a great deal of trouble in hunting after him. Higher up is Sengang, where the Rajah Mudah resides, who, by long usage in Perak, is the heir apparent to the throne, though not a son of the present Sultan. Beyond this we arrive at Qualla Kangsa, 150 miles from the mouth of the river, where Rajah Lela, the principal accomplice in Mr. Birch's murder, resided, and who is still at large, having escaped our efforts so far in apprehending him."

Mr. Swettenham describes the view of the Perak River, as seen at Qualla Kangsa, in these terms:—"I have certainly seldom seen a prettier view than I am looking at now; about 3 miles of the beautiful Perak River is lying at our feet in a convex curve, the Kangsa River joining it at about 50 yards from where I sit. The Maharajah's house is just opposite a little to the right in a cluster of coco-nut trees, the whole view being shut in all round by the low but varied hills of the Ulu Perak." On this occasion, which was in February of 1874, they began to perceive a growing unfriendliness on the part of the Malays, for, whereas they had been received before with a peaceful demeanour, he now

saw the people around him armed to the teeth. Maharajah Lela, likewise, excused himself from receiving them, and sent his son instead to represent him. "The country on the left bank opposite Qualla Kangsa," he adds, "is evidently very thickly populated, there being apparently houses scattered all the way to the foot of the hills, about 4 miles off." The river north of Qualla Kangsa is thus described by the special correspondent of the 'Penang Gazette,' who is the first to have written on this part of the Perak River:—"By the kind permission of Captain Garforth, I was enabled to go up the river yesterday with the exploring expedition. We started at six o'clock in the morning, and got up to Kota Lama (old fort or stockade) by nine. It is a village of considerable size, and, as far as we could see, the inhabitants seem to have been wonderfully little disturbed by our settlement at Qualla Kangsa. Many of them came down to the banks and squatted down, chewing betel-nut, and gazing thoughtfully at us. Still more seemed to think it was hardly worth the trouble to come and even do that. Kota Lama is a large village surrounded by a number of kampongs, or smaller villages, so it is difficult to determine where Kota Lama ends, and where the kampongs begin. It has long been the asylum for the criminals of the whole surrounding country. Every murderer, every thief, from Penang, made for Kota Lama as a place where he was certain to find a shelter and congenial companions. The neighbourhood was kept in constant terror by them, and even the Bandahara was unable to exact the vassalage which he claimed from his surrounding neighbours. Several letters were found in the Chief's house, showing that he was in communication with Ismail, and that a few months ago he was called up to Kinta, to give his counsel in 'an important undertaking'—possibly the murder of Mr. Birch and the subsequent rising." It will be remembered, I may remark *en passant*, that it was at a village above Kota Lama where Major Hawkins, of the Bengal Staff Corps, and a small party of men, fell into an ambuscade and were killed. "On the opposite bank, a little further up, is another village which, as well as Kota Lama, has a large number of fishing-stakes in the river. We also saw numbers of buffaloes, goats, and game-fowls. In fact, except for rice, these Malays seem to be very well off in every way. As we approached the hills the banks became more and more declivitous, and the bed of the stream was narrowed in parts, while occasional boulders and rocks appeared in it. The banks are studded with houses and small hamlets, and in some of these places considerable clearings had been made in the jungle, probably by Chinamen, for the Malay seems to have an incurable dislike to work. At noon we landed on the left bank under a

huge banyan-like tree. The jungle here was all of secondary growth and tolerably dense. A path, whose well-trodden condition testified to the number of inhabitants in the district, ran parallel to the river along the top of the bank, rising here about 30 feet high.

"The current here runs very strongly all the way, so that it was past five when we reached Chiga Gala, our destination, and the site of the supposed stockade. A white flag was hoisted when we hove in sight, and this naturally induced us to believe that there really was a stockade. No such thing, however, exists. The chief man, a vassal of Usuf's, came down to see us. There is no stockade whatever in the kampong, or village, which consists of some forty or fifty houses. Beyond this up the river, he said, there were no villages of any size. The distance from Chiga Gala to the head of the river, he says, is fifteen days' journey, say 260 miles. From Chiga Gala we could see a lofty range of hills away to the east, one part of which must be about 8000 feet high. The River Kinta probably has its source in this range, and some tributaries may possibly run from it into the Perak River. Between Qualla Kangsa and Chiga Gala the Perak has no tributaries that one could not step over. The distance from Qualla Kangsa must be about 16 miles, as it took us four hours to get back to camp. At Chiga Gala it is reported that gold has been found. This the Malays, when we questioned them, of course denied; but owned to the existence of tin." Other portions of this writer's letter are equally as graphic and interesting; but as they bear on the military operations of the expedition, I must abstain from making any further extracts. as they are out of place here. I shall, however, quote him again as to the produce of this part of the country, and the sudden rises the river seems subject to by floods, and then take my leave of a most agreeable correspondent, who has furnished us with so much valuable information on the geography of a district hitherto unknown to us. "The absurdity," says he, "of the reports that the Malays were starving was already shown in our expedition to Kota Lama. Every house had bags of rice in it, and some were regular granaries. Flocks of goats and fowls were seen everywhere, and there was a considerable amount of paddy-ground on which crops were just ripening. Plantain (the banana) groves, of course, there were in great abundance; and the numbers of boats and nets showed that fishing was not neglected. The warlike character of the village was evinced by the number of blacksmiths' and armourers' shops, in which quantities of knives and old iron were found. Further operations," he adds, "are at present impossible, owing to a sudden flood. The river rose 14 feet in twenty-four hours, and there is a strong

current running, carrying down logs of trees and bushes. Part of the Bandahara's village is under water, and a small village on the other side of the Kangsa River is also flooded. The Perak River, on which the village of Qualla Kangsa stands, is about 200 to 300 yards wide." I am surprised that the writer did not learn anything respecting the river running eastward from the Perak River above Chiga Gala. The river is put down in a lithographed map copied from one made by Mr. Birch, and is called the Plus River, the word signifying nothing that I know of in the Malay language; however, it is given in the map as a considerable stream, deriving its source from the range of mountains forming part of the Malayan central chain, and possibly some of its tributaries may be found to run into the Kinta, on which the town or large village of the same name stands, the capital of ex-Sultan Ismail. The Kinta appears to take its rise from the same range, about 20 miles or so above the village of Qualla Kangsa, and keeping about the same distance from the Perak River, runs almost in a line with it till it approaches Passir Sala, where it begins to converge and narrow the distance between it and the Perak by some 5 or 6 miles; and when it reaches almost a level with Passir Sala, it breaks out into two branches and flows into the Perak, forming an island in its embrace, in which is situated the village of Bandar Bahru and the English Residency. The Kinta River is fed by several tributaries, between two of which stands a hill called Gopin, also celebrated for its tin mines. Another considerable tributary of the Perak is the Bidor, which empties itself into it near the Laxamana's village at Durián Sabatang (*i.e.* the One-branched Durian Tree); it also takes its rise from the same range which forms the watershed of the rivers east of the Perak River, and is fed by two principal tributaries, the most important of them being the Batang Padang, or Sword-branch River. Between these main rivers the country is, as already described, rich in lands consisting principally of alluvial deposits, well watered, and admirably adapted for the cultivation of our most valuable Eastern productions. Cotton has never been tried out in these parts to any extent; but I dare say it will be found to answer quite as well, if not better, than in India.

I now come to the southern portion of Perak, which is separated from the Malay State of Salangore by the Bernam River. This boundary has been the bone of contention between the two States for more than half a century, and the banks of the river have been the very seat and stockade of pirates, from whence frequent attacks were made on native shipping in the Straits of Malacca. To preserve something like order between

the two States, treaties were made by us in 1818 and 1826, to define the boundary; but the terms were never adhered to for any length of time. At last, in 1870, the piratical hordes who dwelt here became so troublesome, that measures were taken to dislodge them. The Viceroy of Salangore, Tunku dia Oodin, was directed to do so, and aided by our influence he succeeded, after some severe fighting, in clearing this nest of turbulent chiefs and troublsome pirates. It is now settled, I believe, that the Bernam River is the boundary between these two States, and with an occasional visit from one of H.M.'s gunboats, I feel sure that any riparian disputes which may arise can be easily settled without further bloodshed. The Bernam River extends about 150 miles from the sea into the interior, taking its rise from the hills forming a part of the grand mountain chain of the peninsula. At about a distance of 50 miles from its mouth, and 4 or 5 from the village of Bernam, it is fed by three tributaries —Silim, the largest, feeding it from a north-easterly direction.

Some distance up the river the population is considerable; the houses have an air of comfort, and the plantations of fruit-trees and paddy-fields appear to be well tended and cultivated. The country between this and the Perak River is described as being very picturesque and of surprising fertility. Cattle are found in great abundance: the water in the streams is clear as crystal, and the population is said to be healthy and content. At the villages on the river coffee was observed to grow well, and to yield a large supply of berries. The natural water communications throughout are excellent, nor is the country by any means a difficult one for road-making.

To complete the geography of Perak, I must add a few words on the Island of Pangkore (ceded to us as far back as 1826). It is a barren rock separated from the Dindings by a narrow but deep channel, which affords a good anchorage. The Dutch had a fort on it once, for the purpose of levying dues on all the traffic that entered or left Perak by the Dinding River. "This island," says Sir A. Clarke, "has formed a nucleus for numerous fugitive families of Malays who were compelled to flee during the late disturbances on the mainland, and is now fast becoming, under that feeling of security which the shelter of our flag always gives, a small but thriving settlement. The position is necessary to us as a pure matter of police, from its situation at the mouth of the Dinding River, and commanding a perfect network of creeks affording shelter and concealment for pirates, as was abundantly shown in the late disturbances, when they were constantly enabled to evade and set at defiance the ships and boats of Her Majesty, by running in-shore and hiding in some of the inlets." These creeks vary from a considerable width to barely

that of a small boat, with a depth of only an inch or two; in fact, some run dry at low water. They are all overhung by trees, whose branches droop over the water's edge.

Salangore.—I now come to the adjoining state of Salangore. In 1825 its boundary was said to reach from the Bernam to the Linghie River in Malacca; but, in consequence of changes that have taken place in the government of the country, it is now confined within narrower limits.

This kingdom is of recent origin, and its name appears to have been given to it by a colony of Bugghese people from Celebes.

Until the year 1862, though nominally under one head, the country was divided into several independent States, whose Chiefs were constantly fighting against each other, either for business or pleasure. At length a son-in-law of the Sultan's, named Tunku dia Oodin, a man of great energy and strength of purpose, curbed their power by force of arms; and for the last five or six years the old Sultan, reinstated in his sovereign rights, has been treated once more by his feudatory Chiefs as their lawful suzerain. We have had treaties with it of commerce, extradition, &c., since 1818, and Europeans and British subjects have traded along its coast for some time; but no European, until recently, had penetrated far enough beyond the estuaries of its rivers to give us any account of the country. Its rivers have been more or less the rendezvous of pirates for generations; but they were never so venturesome as they were in 1871—that is before the Tunku took the affairs of the country into his hands—for in that year they captured a junk, and murdered its crew and passengers, shortly after leaving the harbour of Penang, having in the first instance passed themselves off as native traders; and in 1874 they had the audacity to attack the captain and crew of the Lighthouse situated on Cape Rachada, between the Jugra and Linghie River.

These among other flagrant outrages, too many to mention, called for the interference of Sir Andrew Clarke, who lost no time in having a close investigation made into the matter, and for this purpose the following gentlemen were selected, viz.:—Mr. Birch, Mr. Irving, Lieutenant-Colonel Shortland, Captain Bloomfield of the *Teazer*, and Captain Robinson of the *Rinaldo*, to visit the country; and glad as I should be to place the detailed services of each of these gentlemen on record, the space at my command will not allow me to do so. I must, therefore, content myself by saying that they brought their task to a most successful issue, and that the result of their work may be summarised in the following way: the pirates were discovered and given up for punishment, their stockades completely destroyed, and the

Tunku, who had been regarded somewhat in the light of a *parvenu* by the Chiefs, was nominated officially by the Sultan (through the advice of the Governor) as the Yam Tuam Wakil, or Viceroy of the Sultan. Finally, I may say, the country seems to be recovering its trade and showing evident signs of returning prosperity. The Tunku and the Sultan have steamers plying up and down the coast, and roads are being made to open up the country. What they want now is British capital, to work out its mineral resources; and if a gunboat made its presence visible once a month or so on its coast and rivers, I think there is every prospect of peace and happiness kissing each other on these shores for a long time to come.

I shall now go on with the geographical summary, which I have culled from the despatches and correspondence of the above-named gentlemen. The territory of Salangore lies between lat. 4° and 2° N. Its northern and southern boundaries are the Bernam and the Langat; and from the coast it extends eastwards inland to the confines of Pahang and Tringanu. As far as we know at present there are three principal rivers running through the country, and situated about the same distance from each other, excepting the boundary river and the Salangore, between which there is a very wide gap, which I cannot imagine to be quite as destitute of water as it is represented in the map. These rivers are known as the Salangore, the Klang, and the Langat.

The Salangore River passes from the interior in a westerly direction till it falls into the sea at the site of the town of Salangore, N. lat. 3° 20′. Captain Bloomfield and Messrs. Birch and Irving explored this river for some miles in July, 1871, and after examining the forts destroyed by the *Rinaldo*, the position of which they considered to be "exceedingly remarkable, and might, if the upper fort were properly armed, be rendered unassailable," they weighed anchor, the *Teazer* leading, and steamed up the river for about 13 miles. "At every village we passed," says Mr. Birch, "the women and children were seen fleeing to the jungle, but the men came down to the banks of the river perfectly unarmed—a very unusual practice for a Malay." They then landed at one or two small kampongs or villages, the inhabitants appearing to be at first in a great state of terror, but "on finding themselves kindly spoken to," says Mr. Irving, "they soon became reassured, and brought us coco-nuts, &c." The poor people gave a miserable picture of the oppression they suffered at the hands of the followers of the different rajahs, and "I have no doubt," he adds, "that in this respect every word that they said was true." They said they were obliged to live "deam-deam," that is, very

quietly and unobtrusively; that they dared not cultivate their lands, and had to exist on coco-nuts; and that, even as it was, they were fired at, and plundered, and abused. A suggestion that the English Government might step in and settle the country was received with a sort of gasp of satisfaction, the genuineness of which could not, I think, be doubted by any one having any acquaintance with these people. From Captain Bloomfield we have the following account of the river:—"Being unable," says he, "to obtain any information about Salangore River, Mr. Barrett, Navigating Sub-Lieutenant, volunteered to sound it, and having returned with a satisfactory report of its depth, we went up the river the following morning (July 19), followed by H.M.S. *Pluto*, with the Colonial Secretary (Mr. Birch), Mr. Irving, and the Tunku dia Oodin on board. She followed us up the river to a mile or two above Kampong Quedah, which is on the left bank about 11 miles from the mouth. The river gradually narrows from about 200 yards in breadth for the first 4 miles to about 70 yards at the Kampong; it is very tortuous, with a flat country on either side, nearly on a level with high-water mark, and bordered, as far as I went, with continuous nipa and mangrove. Occasionally we passed a house or two with boats hauled up amongst the nipa. At Kampong Parrang, which is on the right bank and nearly opposite to Quedah, there is a rather strong stockade not visible from the river. The village itself is on a much larger scale than the others, which consist for the most part of from six to a dozen houses, with small coco-nut plantations. The spring tide was running very strong, with a rise and fall of at least 15 feet, which necessitated speed in turning the bends and care in anchoring, there being scarcely room to turn between the banks. On July 28th Captain Bloomfield revisited this river, on which occasion Mr. Barrett "examined 10 miles more of the river, in all 22 nautical miles from the mouth, at which distance it ceases to be tidal. 'It is not navigable for anything but boats beyond about 5 miles above Kampong Passanay'; and I should not advise vessels," says he, "drawing more than 10 feet water ascending the river until a more accurate survey is made."

It is a safe rule in navigating all these rivers, in approaching points, to steer over to the opposite shore, keeping close along it, where the deepest water will always be found, the shoalest being frequently in mid-channel; and, as a rule, deep water will always be found in the narrowest, and shoal water in the widest parts of the river."

The next river is the Klang, or Callang, a name given to it by the Bugghese colonists; it takes its rise at the foot of a mountain in the interior above 2000 feet high, and flowing in

a south-westerly direction past the town of Klang, empties itself into a narrow strait of the same name, about 6 miles to the north of the Langat River. It is said to be navigable for vessels of a light draught for some 15 or 20 miles as far as Damar or Daman Sara, and for boats, by poling, for more than 80 miles above Pangallan Batu to Qualla Lumpor, in the neighbourhood of the tin-mines, although it is probable that the base of the mountains from which it takes its source is not more than 25 miles distant. The banks were higher and the country much less swampy than that on the Salangore River, becoming hilly and fertile on approaching Pangallan Batu, which is 10 miles from the mouth. Captain Bloomfield's estimate is that the revenue from tin alone of the Klang and Salangore rivers will bring in 100,000 dollars, or say 25,000*l.* a year, "as soon as the country has recovered from its present alarm." Since Captain Bloomfield's visit, Mr. Swettenham has been appointed Resident at Langat, the residence of the Sultan, and as he has visited more of this country towards the interior, we may hope to have fuller information respecting it on a future occasion.

On leaving this river, Captain Bloomfield proceeded by the Straits of Colong and Lumût to the Langat River, and after steaming for about 25 miles through a very tortuous passage, but between a fertile and well-wooded country—where forest-trees and tree-ferns took the place of the wearisome mangrove and nipa seen on the banks of the Salangore—they arrived at Langat, the residence of the Sultan of Salangore. The source of this river is also to be traced to the watershed at the foot of the Malayan range of mountains, and, after flowing several miles through the country, is divided a short way above the Parcelar Hill, lat. 2° 46′ N.: one branch, called the Jugra, carrying its surplus water, with a strong current, into the sea, about six or seven miles off; while the other, after running in a north-westerly and winding course, empties itself into the Lumût Passage. The Sultan's house is situated in a favourable position for commanding both rivers. Mr. Braddell, the Attorney-General for the Straits Settlements, who visited this place with Sir A. Clarke in February, 1874, informs us that above this point the river passes through a plain beyond the influence of the salt-water tides, and capable of any inter-tropical culture. For 10 or 12 miles up the river he perceived a wide open country between the forest and the river's bank, showing, as he thinks, that, at one time or other, the great plains had been cultivated. There were numerous detached houses, but no villages all the way up. Numbers of people, says Mr. Braddell, were met in their boats on the river, all of whom on seeing the steamer pushed their boats inshore and ran inland.

This distrust of Europeans, unfortunately too common on Malay rivers, was doubtless aggravated on the present occasion by false reports of the purpose for which the steamers had come. The depth of water, following the channel from bight to bight, was between three and four fathoms the whole distance we went. "On the Langat River," says Mr. Birch, "there is a great abundance of valuable land, the soil of which is capable of growing sugar or tobacco in any quantity with every prospect of success. I was much struck with the very fine quality of the paddy grown here, where the crops seemed very abundant." The vegetable production of this country being like that of its neighbour, my remarks on it would be mere repetition. As to its general character, Mr. Irving's words appear to me to include all that can be said of it. His words are—"It is a magnificent country, with a fine soil and great mineralogical resources. It is watered and opened up by fine navigable rivers, which run up within easy distance of the richest tin districts, situated in the watersheds of the Salangore, Klang, and Langat rivers. It only wants security for life and property, and a few easily constructed roads, to make it burst out into exuberant life."

I come now to the nine States adjoining Malacca, known as the "Nigri Simbilan."

Except Sunghy Ujong, which appears to have seceded from Salangore of late years, and to have thrown in its lot with them, these States have been independent since the breaking up of the kingdom of Johore, to which they once belonged. They are confederated States, like the German Bund before its absorption into the Empire, though instead of appealing, as one of the States of the Bund might have done either to Prussia or Austria, they elect a head-man, called the Dato Klana, to whom, I understand, disputes are referred which cannot be arranged amicably between themselves. The Dato is not elected from their own people, but from the people of Menang-Kabu, in Sumatra, which the Malays look upon as the cradle of their race. This confederacy appears to me marvellous strange in a land were the people are born and nurtured in an atmosphere of despotism. I know of no other instance like it in Malay history.

Though we are now furnished with an excellent survey map of the River Linghie, which forms the southern boundary of Salangore, made by Mr. Daly, the Government Surveyor at the Straits Settlements—to whom we are also indebted for a map of the nine States—we have but a very scanty description, in a geographical point of view, of the countries he has been at the pains of surveying, and while passing through

one of which he was made prisoner. It is, however, a comfort to know that we have now, through the surveys of Messrs. Birch, Woolcombe, Daly, and others, a very reliable map of the countries west of the Malayan range; and I hope as this portion of the country rises in public interest, we shall be supplied with ampler details, which will afford us a full and thorough knowledge of this country and its wonderful resources.

At present I must content myself by giving you a description of Sunghy Ujong, such as I have been able to put together from some of the sources already of great service to me, and for the country north-east of the Linghie River, and some of the independent States, I have to thank the special correspondent of the 'Straits Times,' who accompanied the Sunghy Ujong Expedition.

The state of Sunghy Ujong, or, in English, River End, is a very prosperous tin-mining district, lying north and south between the rivers Langat and Linghie, and east and west between the sea and the kingdom of Pahang. Besides these two rivers, there are the Sappang and the Lukût, which do not seem to stretch very far from the coast. The Linghie River takes its rise beyond the Residency a little above the Dato Klana house at Rassa, and being fed a few miles below the village of Paroa by a tributary, whose source is at the foot of Bukit Putus, flows in a winding course to the small town of Linghie, and then to Bukit Tiga, where some stockades had to be destroyed in 1874, on account of piratical attacks made from them on the passing traffic, and on one occasion on some of our police, entrusted with a letter to the Shabandar, or chief of Linghie. From this it passes by Sembang, the Malacca police-station, and thence on to the sea. The distance from it to Rassa is a two days' journey by boat, and from Rassa it is a five days' march to the Lukût River. Some twenty years ago I remember seeing a Sultan of Linghie at a fancy ball at Singapore. He was invited to join the gay throng; but he begged to be excused, on the ground of custom, and the loose fit of his shoes. I should fancy his place has been filled, for aught we know, by a piratical successor, for the one I saw had not at all the look of a buccaneer.

In the very heart of the country, and on the boundaries of Dato Moar and Jellabu, are two high mountains, called Bukit Ansee, 3360 feet high, and to the north of it Bukit Lanjun, 3000 feet high. Between these two mountains run a chain of high hills, called Bukit Putus, through which flows the stream feeding the Linghie, and whose shallow bed forms the only path in this pass leading eastward to the Terrachee Valley. About 5 or 6 miles from the mouth of this pass is the stockaded

position of Paroa, where the fighting first commenced in this part of the country. On the 2nd of last December the police were driven back from a station they occupied here on to Rassa by Malays from the disaffected States. On the 7th the 10th Regiment, under Lieut. Hinxman, and the Arab Contingent, under Captain de Fontaine, captured the stockades on the Paroa, and, after severe fighting, drove them on to Bukit Putus.

This repulse, it is said, saved Sunghy Ujong and Malacca from a raid of the Rambow men, who only waited for a success in this quarter before making their descent. Bukit Putus is thus described: "The pass itself is a narrow defile, 2 feet broad at the bottom, with sides almost perpendicular rising some hundred feet high, and covered with dense forest, through which it is impossible to see. Along the bottom of this cutting runs a small stream, the bed of which in reality forms the path. When the centre of the pass is reached, the path bifurcates, passing round a circular mound with precipitous sides about 50 feet high; and on the top of this knoll is the centre and most powerful stockade, right in front of the defile, and looking down on it. A little in front and on each side of the pass are two other powerful stockades, flanking the pass, and preventing the occupation of the hills on either side of the pass by a hostile force.

The position, if held by a handful of British troops, would defy the assault of thousands; and our gaining possession of it, with only the loss of one man killed and one wounded of the 1st Goorkhas, was indeed a wonderful piece of good fortune, due to the intrepidity of Captain Channer, and the bad look-out of the Malays, Captain Channer having jumped right into the stockade whilst they were preparing their evening meal." This bad look-out may be accounted also "from the utmost reliance they had placed on this formidable position, and also in imagining that no European troops could possibly penetrate to their rear through the thick jungle which covers the whole of the adjacent Bandole Mountains." But in this they were completely deceived, for Col. Hill and his men, who had marched to Terrachee *viâ* Pantay, and who had now made their way through this jungle, attacked them in flank and rear, and drove them into the valley of Terrachee and the surrounding country.

Bandole is a scattered village in an open country, about 4 miles from this formidable pass, from which you descend gradually into the beautiful valley of Terrachee. The line of march runs through the centre of a beautiful valley, highly cultivated, and rich in paddy-fields, coco-nut plantations, cattle,

goats, ducks, fowl, &c., and studded all over with detached houses, all evidently deserted in the greatest hurry. About a mile further on they joined Col. Hill's encampment, which was on the Sri Menanti side of Terrachee; and so the two columns, under Colonels Clay and Hill, entered Terrachee without opposition, and were soon encamped on ground which the Malays proudly boasted "was never trod on before by the white man."

After this the column under Col. Hill proceeded by Gumatie, a village on the Moar River, into the centre of Dato Moar's territory, and having destroyed the house of a chief who had imprisoned Mr. Daly while in the act of surveying this part of the country two or three months previous to the outbreak of the war, they swept right across Dato Moar's country, which is described as extremely fertile and rich, and abounding in rice and cattle, on to the adjoining State of Sri Menanti, where they again joined Col. Clay's column, who had taken a southerly route over the Sri Menanti hills, which for three miles after they had left the road from Terrachee was one continuous chain of declivitous hills, overgrown with a dense jungle. After leaving the hills the force entered a most lovely country, highly cultivated, and abounding in fruit-trees of every description. Buffaloes were seen in abundance, whilst goats and poultry of all kinds were found in every hamlet, the natives evidently not having had time to take them away.

Having destroyed the stockades of Dato Antar, another troublesome chief, the main body retired to Parit, or Sarit, a village half a mile from Terrachee, and "situated in a beautiful and highly-cultivated valley, studded all over with houses, which, like the rest, were also deserted." In the meanwhile Jompole, a State between Menanti and Johore, was visited by a small column under Captain Ranken, who, finding the country deserted, fell back on the main body. On the 6th of January of this year, about a month from the first day's engagement, all the forces, excepting a small one left at Rassa, were preparing to leave the country *viâ* Linghie River and Lukût. I ought to add that the Pantay district, north of Mount Lanjun, by which Col. Hill made his clever flank movement, is described as one traversed by high hills, covered with a dense forest, and crossed by numerous streams. To the east of Bukit Putus rises the source of the Moar River, which, after passing by Gumatie, and keeping in a circular direction through three Malay States, flows between Johore, which it separates from the Malay State of Moar, and then empties itself into the sea. On the west Moar is bounded by the Kassang River, Malacca, and Johore. It is the territory of Sultan Ali, and in the centre

of it is Mount Ophir—the supposed Biblical Ophir of the Portuguese—rising to a height of 3840 feet. I have seen it very plainly, and made a sketch of it several times from the town of Malacca. It has a fine bold head, and the hills around it are covered with dense jungle-trees. Gold has been found in its neighbourhood, and the plains near it are spoken of as being extraordinarily fertile and productive.

The Malays.—It seems to me rather late in the day to talk about a race with whom we have come in contact, more or less, for the last 80 years; but when they are spoken of as a "set of savages," and when we are told they were going in for a "religious war," it shows plainly that we have still something to learn about the Malay.

This is not the place, nor have I the time, to enter as fully as I should like to into the ethnology of the Malay race; nor shall I waste time by quoting authorities to strengthen what I have to say. I prefer to give you a very brief description of the Malay, as I have known him during the 17 or 18 years of my life, which have been passed in his company, and, I may say, in hourly and daily communication with him. The Malay race is said to have come from Menangkalu, on the opposite coast of Sumatra. As a rule, he is a man below the middle height. His colour is of a healthy copperish-brown—a kind of mixture of the Chinese and Mongolian tint, with a dash of the deeper tinge of the Hindu mingled with it. His hair is black and straight, and usually worn short, with a kerchief tied very jauntily round his head. His teeth are square and very regular, his lips are not thick, and his mouth is nicely shaped. His nose is regular, but it distends a little too much towards the nostrils, which sometimes rather spoil the general contour of the face. His eyes are round, black, and intelligent, shaded with moderately thick eyebrows, and fringed with handsome eyelashes. Like the Mongolian in one respect, he is a beardless man; and when he does attempt a moustache, it hangs on each side of his lips as if it were badly pasted on. Whiskers he has none; but his cheek-bones are not so high, nor are his jaws so thick as the Mongolian. Generally speaking, he is not a muscular man, unless he is a sampan or boatman; and then I have seen a pair of biceps and a chest which no trainer would despise. They are a spare-built race, and corpulency is a sight which meets one's gaze with wonder. In his movements, especially when of aristocratic blood, he is always graceful, and his manner unostentatious, civil, and pleasing. He can always subdue his temper under the moral or physical lash of his superiors, though among his own rank, especially when insulted or grossly outraged, he is apt to run riot, or, as he calls it, *to*

become or to run *many â môk.* He is not by nature a combative man, nor has he much power for mental or physical endurance. He has proved a good soldier in Ceylon; and under plucky leaders, who will sustain his courage throughout the battle, he will fight to the death like a tiger. As a class, he is rather given to habits of idleness and improvidence; but yet I have seen many of them very industrious, persevering, and provident, and with a little encouragement they make very good and steady workmen.

He professes the Mahommedan faith; but he is no fanatic; and in the whole course of his history he has never been known to go to war for religion; he is most liberal towards the creed of others, and, to my knowledge, no priest has ever succeeded in persuading him to thrust his faith down the throats of others at the point of the sword. Those along the coast and rivers are naturally given to a marauding and piratical life, as the easiest way of procuring a livelihood. But those who inhabit the interior of the country, or those who have come in contact with us as traders, &c., abhor piracy quite as much as we do, and are not by nature brutal or savage. When roused to a state of frenzy, as he has been in the late war, I have no doubt he has been found to be ferocious as a wild cat; but we must not judge of a people in a state of wild excitement, and put that down as their normal character. His principal food is rice, herbs, and fish, which he dresses in various ways. His curries are very excellent and delicious, and the *chef* of the Madras Club is unable as yet to gain from him its exact recipe. In fact, he never will, for it rests with native genius.

The Malay is a teetotaller from his birth, and strong drink is positively repulsive to him. The women are lighter in colour, and shorter than the men. They have very fine, long, glossy, black hair, and though, perhaps, not quite so handsome as the women of India, they are gracefully shaped, and very elegant in their movements. After a certain age they spoil their teeth by an inordinate chewing of the betel-nut, the syreh-leaf, and other ingredients, which rather detracts from their otherwise very engaging looks. They make very affectionate mothers, and are most devoted as nurses, in which line they are largely employed in the Straits Settlements. The Malays are people whom you can trust, and make staunch friends of. "Oriental duplicity," as we know it, is not a part of their character.

The Malay can be cunning at times, and very deep, but this is not the general tenor of his disposition, which I have always regarded, on the whole, to be frank, open, and ingenuous. For a further account of him, and his manners and customs, I must refer to the works of Sir Stamford Raffles, Marsden, or

George Windsor Earl. These writers, especially Raffles and Mr. Earl, whom I knew very well, thoroughly understood the weak points of the Malay, and likewise appreciated the many virtues he possesses as a man. To them the Malay was not a savage to be kicked and trampled upon, but one whom they always desired to educate in the paths of industry and self-reliance, and to see him raised by his own exertions to a position of independence and content.

Vegetable productions.—To take it broadly, the country is very plentiful in fruit-bearing trees, and also in other trees used for building and commercial purposes. Along the banks of nearly all the rivers, and on the slopes of the mountains and in the forests inland, are found the Chingal Tambaga, the Tamboosan, the Rangoon teak, and the Murabu. These trees grow to a great height, and their wood, being noted for its firm grain and great durability, is largely used for masts, spars, and buildings. The india-rubber and gutta-percha trees yield a gum said to be very good and free from impurities, and a tree called the Kroony Sarru produces an oil having the properties of linseed, and is used in Penang as a vehicle in the mixture of paints.

Mineralogy.—In the way of minerals, iron has been found in several places in Perak in the form of immense masses of solid ore, which only requires proper machinery to render it profitable.

Saltpetre has been found in large quantities in Perak, and is obtained from a nitrous mud, which has been forming for ages in certain caverns and clefts of the rocks in the interior and along the sea-side.

Gold is met with in almost all the rivers of Perak, particularly in the beds of the mountain-torrents, and indications of this metal have been found among the mountains in the interior, especially near Gunong Ranjah, near the districts of Pahang and Tringanu, where gold is found in abundance.

But the greatest mineral production of the country is tin, which seems to be met with in almost every part of the interior, and in very great abundance. The tin-districts which have been most worked of late years are situated at Klang, in Salangore; at Laroot, in Perak; and at Linghie, near Malacca. "The mines in these districts," says Mr. Braddell, "are so rich, and the profit of working them has been so great, that, notwithstanding the difficulties in dealing with the Malay Chiefs as to the royalty to be paid, and notwithstanding the oppression of the Chiefs, and the frequent massacres of the Chinese miners, they are still attracted to the place, and succeed yearly in sending large quantities of tin to Singapore and Penang."

From a want of machinery and a proper method of working

the mines, the yield is not so great as it might be.. "The tin-ore," says the same authority, "is found in strata in the ancient watercourse near the hills, at a depth of 10 to 20 feet. When the existence of the ore is ascertained by digging down to it, the miners mark a line for a certain length along the centre line of the valley. They dig out the superincumbent earth on one side, laying it on the other side, till they reach the ore. The ore is then taken out and stored, the earth is replaced, and the other side is dug out, and so on until enough ore is collected for smelting. There is no undergound work; the men dig the earth with hoes, and carry it out of the holes in baskets. The ore is washed in wooden gutters, and is smelted in open furnaces with a common cold-blast bellows. The process of washing and smelting is very imperfect."

A large percentage, says another writer, equal to about 25 per cent. of the pure metal, is lost by being left in the dross.

The revenue from tin in Salangore was estimated by Captain Woolcombe, in August, 1871, at about 22,000*l.* (or $100,000) a year.

In 1874 the export of tin from Laroot alone was 11,088 piculs, say 600 tons, which was valued at 46,055*l.*, or $218,750.

In November, 1875, Captain Speedy estimated the out-turn of tin at 79,200 piculs, about 4702 tons, of the value of $1,584,000 = 333,475*l.*

These are figures which have been sent in by officers connected with the Colonial Government at the Straits Settlements, and which may be relied upon, for I need scarcely add they have been delivered in the official course of their duties, with no intention of either raising or depreciating its market-value, as is proverbially done with us by a set of animals familiarly known as the bears of the 'Change. From these figures, however, it will be seen that the yield of tin is quite insignificant to the quantity that the country ought to produce if the works were systematically carried out with the aid of proper machinery. In conclusion, I have merely to say that what is now wanted is only British enterprise and British capital to work out the resources of this country to their fullest extent, and to render the mineral wealth which Nature has so abundantly and profusely endowed it with, a benefit, not only to ourselves, but productive, I hope, of much material happiness to its people.

XIV.—*The Watershed of Central Asia, East and West.* By Lieut.-Col. T. E. Gordon, R.E.*

The diplomatic mission under Mr. (now Sir Douglas) Forsyth, sent to Kashghar in 1873 by Lord Northbrook, the Viceroy of India, gave us an opportunity of entering upon the somewhat unknown geographical field of the Pamir tracts, and of gaining information there which has cleared up considerably the hitherto obscure topography and hydrography of the high mountain lands lying between Eastern and Western Turkistan. I had the good fortune to be in command of the party detached from the mission to explore that region. I now propose to give a short account of our journey and observations from Eastern Turkistan to the Oxus and back, along both the Great and Little Pamir routes. But before commencing my narrative, I shall briefly notice what were the points in doubt before we went over the ground, and how far Wood and former travellers had gone.

Previous travellers.—The first to enter on the Oxus basin and Pamir tracts was the Chinese Hwui Seng, who, in 518, crossed from the valley of Wakhān to Tāshkūrgān by the Little Pamir route, and thence to Kashghar. The same route was followed shortly after by Sung Yūn, passing from Kashghar and Tāshkūrgān. These Chinese pilgrims were followed by the more famous Hwen Tsang, who in his return journey to China in 644, crossed by the Little Pamir to the Kizil Art. I would here mention that I am confident that the great lake he particularly notices is the Great Kārakūl, for it is impossible to believe that he could have ascribed such size to any lake he saw on the Great or Little Pamirs. After Hwen Tsang came the grand old traveller, Marco Polo, who, with his kinsmen, crossed by the Great Pamir to the Kizil Art Plain in 1272–73. He was followed by the lay Jesuit, Benedict Göes, who took the Little Pamir route to Yarkand in 1602–3. Wood, in 1838, proceeded from Badakhshan to the foot of the Great Pamir Lake, and was the first, however, to give a thoroughly intelligible account of the head-waters of the Oxus, and his clear narrative and precise detail explained away many of the doubts which clung to the meagre descriptions furnished by the old travellers. One of Col. Montgomerie's successful and reliable explorers, known as "the Mirza," crossed by the Little Pamir route in 1868–69; and Faiz Buksh, an *employé* of the Government, crossed by the Great Pamir in 1870.

* Read before the Geographical Section of the British Association at Bristol, August, 1875.

Doubtful Points.—1. The ultimate direction of the flow of the Aktāsh Stream (Aksū), rising in the Little Pamir, and flowing east.

2. Names of the lakes of Great and Little Pamir, and names and position of the other lakes and Pamirs.

3. The culminating point and general character of the so-called table-land of Pamir.

4. The direction of discharge from the Kārakūl Lake.

5. The true watershed east and west.

Col. Yule's Essay 'On the Geography of the Valley of the Oxus,' gives a surprisingly correct description of the topography and drainage of the Pamir tracts. Col. Yule perceived a discrepancy in the Mirza's account of the Aktāsh Stream, and saw that an accurate knowledge of its flow, after reaching the valley of that name, was the important point towards a correct idea of Pamir topography; and it will be seen that he was right in his conjecture regarding the drainage of the Great, Little, and Sirīz Pamirs. He also reduced the lakes to about their correct number; and with reference to the uncertainty concerning the "Tuz" or "Sussik" Kūl, which led to the idea of Wood's lake being so called, we confirm his (Col. Yule's) opinion that it was "difficult to conceive that a lake with so copious an affluent should have salt waters." Mr. Shaw was the first to throw some light on the story of the double discharge of the Kārakūl Lake east and west, by telling of the two Kārakūls—Great and Small—the one giving a stream to the west, the other to the east. We also found him correct in his idea of the Pamir being traversed by hog-backed ridges, between which the drainage flowed; the eastern drainage, however, not contributing to the Yarkand basin, as he supposed, but finding its way to the west and into the Oxus.

I shall now proceed with a short account of our journey. Capt. Biddulph, of the 19th Hussars, Aide-de-Camp to his Excellency the Viceroy; Capt. Trotter, of the Royal Engineers; the late Dr. Stoliczka, a distinguished member of the Government Geological Department, and myself, left the Mission Headquarters at Yangi-Hissar, Kashghar, on the 21st March, 1874. The signs of approaching spring were showing at Yangi-Hissar when we left; but immediately on entering the hills, 24 miles distant, we found ourselves back in the depth of mid-winter. Nearly all the streams were frozen, and snow lay everywhere, while fresh falls were frequent throughout our journey. As there is nothing very remarkable in the hill-country between the Yangi-Hissar Plain and the Sirikol Valley, and as, moreover, the "Mirza" has already given a good and accurate account of the route, I shall not enter into

any detail concerning it, beyond saying that we crossed, on our way to Tāshkūrgān, the three passes of Kaskasu, Tarut, and Chichik-lik, at an elevation of 12,850, 13,330, and 14,480 feet respectively. We reached Tāshkūrgān, in the Sirikol Valley, on the 30th. The distance from Yangi-Hissar is 125 miles.

The open part of the Sirikol Valley extends south from about eight miles below Tāshkūrgān to apparently a considerable distance towards the Kunjūt Mountains (Hindu Kush or Karakorum range). Its average breadth is about 3 miles. Cultivation is confined chiefly to the western slopes, and is the work entirely of the Tājik inhabitants, who occupy a length of about 15 miles of the valley in the vicinity of the fort. The centre of the valley, through which the river flows, is used as a pasture-ground, for which it is admirably fitted from its rich and abundant grass. The hamlets are at present in a wretched-looking state, the houses having fallen to ruin during the late wholesale banishment of the population to Kashghar. The Amir of Kashghar took possession of the valley in 1868–69, and after the manner of Eastern conquerors, deported the population in 1870, to prevent rising or rebellion. They were sent back in 1872. There are now about 600 families in the valley and the neighbouring Tagharma Plain, representing between 2500 and 3000 souls. They appear contented with the Kashghar rule, and appreciate thoroughly the peace and security they enjoy under it, and their immunity from the cruel raids of the Kunjūtis, Kirghiz, and Shighnis, to which they were formerly much exposed. Notwithstanding fellowship of creed (all being Shiahs), the Kunjūtis and Shighnis had no scruples in stealing and selling into slavery their Shiah brethren of Sirikol.

The Sirikolīs say that they have been in the valley for seven generations as a distinct people, with a chief of their own, and are the descendants of wanderers who came from all quarters—from Badakhshan, Wakhān, Shighnān, Hindūstān, Kunjūt, and Turkistan. Hence, as my informant (Ali Dāda Shah, a Sirikoli Mūlla) said, "The language peculiar to us is a mixture of what is spoken in all these countries." The Sirikolīs, like the inhabitants of the small Shiah States in, and adjacent to, the Oxus basin, appear to be of Persian lineage, and speak the Persian language in common with them.

The present fort held by the Amir's troops occupies a commanding position among the ruins of the ancient Vārshīdī, or Tāshkūrgān. The old fort appears to have been of square or rectangular form, with projecting towers, and built of rough, unhewn stone, in the same style as the village houses and towers in the valley. The village towers were used for refuge

and defence in the slave-hunting raids, which the inhabitants suffered from before the establishment of the Kashghar rule. The ruins of the old fort do not show it to have been of great antiquity, or very remarkable in any way. We could not obtain any reliable information of it being older than the occupation of the valley by its present Tājik inhabitants.

The fort forms the residence of the governor of the district, Mir Taksabai Hassan Shah, an energetic, resolute-looking, one-eyed man, said to be a native of Karātegīn. He was very careful to prevent us visiting his fort, and indicated in the plainest but most courteous manner his determination not to allow any of us or our followers to enter it. Thus we were unable to obtain any view of the old ruins at a closer distance than a few hundred yards.

The valley is 10,250 feet above the sea. The cultivation consists mainly of beardless barley, beans, peas, carrots, and turnips. Willows grow thickly by the streams, and poplars show in sheltered spots close to the hamlets. The domestic animals are camels (Bactrian), yāks, ponies, cattle, sheep, and goats. The yāks are smaller than the Thibetan species. They are used in the plough for agricultural purposes. The climate is severe. Hassan Shah, the present governor, who has had five years' experience of it, says that there are only two seasons there—summer and winter—the former lasting but three months, the latter nine.

The valley extends to a great distance above the fort. The river which flows through it (variously called the Tāghdūngbāsh, Tāshkūrgān, Sirikol, Tisnāf, and Yarkand), taking its rise in the Tāghdūngbāsh Pamir and Kunjūt range. Kirghiz occupy it for pasture as far as the Kashghar boundary, said by the governor to be 20 "tash" (about 80 miles) beyond the fort. The Tāghdūngbāsh Pamir lies to the north of, and parallel to, the Little Pamir, from which it is separated by a broad chain of hills joining with the Neza Tāsh Mountains, and forming one unbroken range. The Sirikol Valley, after extending south for some distance, bends towards the west, and merges into the Tāghdūngbāsh Pamir, which appears to be merely a continuation of the valley at a higher elevation.

The Sirikol River was of considerable size when we first crossed it, March 29th. The perfect clearness of its water, the steadiness of its flow, and equality of volume, day and night, and the severity of the cold there, showed it to be at the usual low winter ebb. It is said to be joined about 50 miles below the valley by the Tang, a stream as large as itself. Should this be found to be correct, it is probable that the Yarkand

River may yet be regarded as rising in the Kunjūt range, instead of the Karakorum.

The Tagharma Plain lies about 3 miles to the north-east of the Sirikol Valley, and is of the same elevation. It is a fine open crescent-shaped flat, about 12 miles long by 7 broad, extending from the south-west to the north-east, and is well watered by a stream which flows through it from the north-east end, and falls into the Sirikol River. This stream is plentifully fed by numerous springs in the middle of the plain. A few Sirikolīs reside and cultivate in it; but the main portion of the inhabitants consists of 100 Taiyat Kirghiz families, under their chief, Krumchi Bī, who permanently occupy the plain as a pasture-ground, and visit the Tāghdūngbāsh Pamir. The pasture in Tagharma is rich and abundant.

This plain is separated from the Kizil Art by a low rounded ridge, formed by projecting spurs from the opposite mountain ranges, the Neza Tāsh to the west, and the Tagharma to the east. The ridge forms the watershed between the two plains, the drainage on the Kizil Art side flowing into the Little Kārakūl Lake, said to be about 20 miles distant. The Bārdish Pass leads west from the watershed over the Neza Tāsh range into the Aktāsh Valley, emerging nearly opposite the Great Pamir, and about 30 miles above the junction of the Aksū and the Mūrghāb.

According to the accounts given by the Kirghiz of Tagharma, and corroborated by Wakhis and others, the Kizil Art Plain extends north from the Tagharma to the Alai, from which it is separated by a mountain chain. The height of the two former plains is about the same, and that of the Alai somewhat greater, but still, considerably less than the elevation of the Pamir. The Kizil Art is similar in character to the Tagharma Plain, being well watered, and abounding with grass and fuel (willow). Its length is about 130 miles. It is enclosed on the east by the mountain range extending and sweeping round from the direction of the Khokand Terek Pass and the Alai, and on the west by the Neza Tāsh. The Little Kārakūl Lake lies in the lower, and the Great Kārakūl in the upper end of this plain. The former gives rise to the "Gez" or "Yamanyar" Stream, which flows through the pass of that name under the lofty and massive Mūztāgh, or Tagharma Peak, into the Kashghar Plain, and there joins some of the numerous branches or canals of the Kizil Sū, or Kashghar River. The Little Kārakūl is said to be about 15 miles in circumference, and very deep. The Great Kārakūl is stated to be about 40 miles in circumference, and to give rise to the Mūrghāb, which finds its way through the Neza Tāsh range, and flows towards Shighnān and Roshān. Four

lakes on the Kizil Art and in its vicinity were mentioned as giving rise to streams: the two Kārakūls already described, the Rung Kul in the Siriz Pamir, and the Yeshil Kul in the Alichor. The two latter furnish tributaries to the Mūrghāb. Further mention will be made of these Pamirs and their lakes later on in this narrative.

The Kizil Art is permanently occupied by 1000 families of Kipchāk Kirghiz, who emigrated from Khokand seven years ago under their present chief, Abdūl Rahmān.

We left Tāshkūrgān for Wakhān on the 2nd of April. We proceeded in a south-westerly direction through the Shindān defile, and over the Neza Tāsh Pass (14,920 feet) to the Aktāsh Valley (12,600 feet), which we reached on the second day. The pass is easy of ascent and descent; but the very heavy snow lying on it made the journey over a very severe one to the baggage horses. The Neza Tāsh range runs north along the eastern side of the Aksū, as the Aktāsh stream is called, from the eastern end of the Little Pamir.

On the 4th we proceeded south up the Aktāsh Valley to its head, where it merges into the Little Pamir, extending east and west, the appearance being that of the same valley making a sweeping turn from south to west. We followed up the Aksū to its rise in the Ghāz or Oi Kūl, the Little Pamir Lake, which we reached on the 5th. Almost the entire journey from the Neza Tāsh to the Ghāz Kūl was made through snow, and against a freezing wind, which cut our faces and inflamed our eyes in a very painful manner.

The Aktāsh Valley runs in a northerly direction from the Little Pamir, across the eastern openings of the Great and Alichor Pamirs, and sweeps into the Sirīz Pamir at Ak-balik, the junction of the Aksū with the Mūrghāb. Its length is said to be about 60 miles, and its average breadth, judging from the 20 miles' extent over which we travelled, is about 3 miles. It is a pasture resort of the Kizil Art Kirghiz.

The Little Pamir is similar in character to the Aktāsh Valley, and of about the same breadth. It has the same grassy downs, slopes, and flats. It is bounded on the south by the continuation of the Neza Tāsh range, which separates it from the Tāghdūngbāsh Pamir. The range here appears to sink considerably in height. A broad chain of rounded hills lies between it and the Great Pamir. These hills are low towards the Aktāsh Valley, and rise gradually towards the Lake. The Lake is about 3 miles long, and a little under 1 mile broad. We found it, and the stream flowing from it, entirely frozen. The height is 13,100 feet. The hills on both sides rise some 2000 feet higher, those to the south being completely

covered with deep snow. Extensive glaciers and snow beds lie near the western end of the lake, where the opposite ranges close in considerably. The name Būrkūt-Yursi (corrupted or distorted into Būrkat-Yāsui), applied to the lake by some native travellers, is properly that of the rocky ravine at its head, and means the "eagle's place", or "nest." The "r" is dropped in the pronunciation, as is common in many "Turki" words, and thus the mistake may have been made.

At less than half a mile west of the lake a watercourse, filled with ice, appeared, leading west down the valley. This is the beginning of the Sarhadd Stream, which unites with that from Wood's lake to form the Panja. Six miles lower down a stream from the eastern Tāghdūngbāsh Pamir joins. The valley closes in at a distance of 10 miles below the lake, and the Little Pamir may be said to terminate there. This gives that Pamir a length of 58 miles, calculated to the southern end of the Aktāsh Valley. The Sarhadd Stream from this point runs in a deep set course between steep banks which rise up to the long mountain slopes, along which, by the right bank, the road leads to Langar, 25 miles below the Lake. A stream of considerable size joins there from the south-east.

From Langar the road continues in a general westerly direction along the stream to Sarhadd, 30 miles. In the depth of winter the frozen surface of the river makes passage by this route easy. We found the ice, however, beginning to break up here and there, and our path had to be sought across and back, over the rocky bed, and up and down the steep high banks, making the journey tedious and severe to a degree. In summer the swelling of the streams makes this road extremely difficult, and it is then that the Great Pamir route is followed in preference.

We left the last firewood at the mouth of the ravine leading from the Neza Tāsh Pass to the Aktāsh Valley. Up to that, willow and myricaria are found. No wood of any kind grows on the Pamirs but the wild lavender-plant, which with its woody roots form a good substitute for fuel, is abundant all over them. Twenty-five miles below the Little Pamir Lake, birch, willow, and gigantic juniper appear in thick clumps, and firewood is plentiful from Mat to Wakhān and Badakhshan.

The valley opens out about a mile above Sarhadd, and remains more or less wide to Kila Panja, and beyond. Habitation and cultivation commences at Sarhadd, and continue down the valley, with large tracts of dense, low thorn and willow jungle and pasture flats intervening between the villages.

Resaidar Muhammad Afzal Khan of the 11th Bengal Cavalry,

attached to the Mission, had been sent on with a letter to Mīr Futteh Ali Shah, the Chief of Wakhān, announcing our approach; and a letter of welcome from the Mīr reached me at Langar, while the Chief's eldest son, Ali Murdān Shah, met us at Sarhadd, and accompanied us to his father's fort residence at Kila Panja.

We reached Sarhadd on the seventh day from Sirikol (Tāsh-Kūrgān), and Kila Panja on the twelfth. We were compelled by the extreme severity of the weather to make short marches the first three days from Sarhadd. A violent and blinding snowstorm met us each day while travelling, accompanied by a wind so intense in its coldness as to freeze the driven snow-flakes on our faces. On the fourth day we encamped at Zong, a large village on the right bank of the Oxus, immediately below the junction of the Great and Little Pamir affluents.

We reached Kila Panja on the 13th of April. Mīr Futteh Ali Shah rode out to meet us; and conducted us to our camp, which was pitched on an open plain in the close vicinity of his fort. He was an old man, of tall form and good face, but feeble from age and infirmity. He welcomed us to Wakhān, and expressed himself in the usual Oriental complimentary terms, as happy to see us at Kila Panja.

We remained thirteen days at Kila Panja as the guests of the Mīr. The weather was very severe most of that time. Snow fell on six days, and an intensely cold wind blew regularly till within three days of our departure.

We were told that the Great Pamir, on account of snow, is rarely passable till the end of June, and were assured that a party like ours could not possibly succeed in an attempt to cross it earlier than the 15th April. I despatched one of our own men with two of the Mīr's to report on the depth of snow, and they brought back such an account as induced us to determine on trying the road. The Mīr assisted us by every means in his power, and rendered us most valuable service. He expressed a desire to see a direct trade route to India opened up, and made arrangements for a visit by some of our party to the Baroghil Pass. Every incident of our treatment in Wakhān proved the English Government to be honoured and respected, and its prestige to be recognised in a highly satisfactory manner beyond our Indian frontier in that direction.

Wood has given such a very excellent and accurate account of Wakhān and its people that I shall not here record our experiences. On the 26th April we paid a farewell visit to the Mīr (who, notwithstanding his feeble state, wished to ride part of the first day's journey with us), and left Kila Panja—Captain Trotter, Dr. Stoliczka, and myself—for the Great Pamir; and

Captain Biddulph, accompanied by Resaidar Muhammad Afzal Khan, for the Little Pamir, taking the Baroghil Pass on the way, a spot in the Aktāsh Valley being appointed as our rendezvous on 4th May.

We (the Great Pamir party) halted the first day at Langar-Kisht, 6 miles from Kila Panja; a considerable village on the right bank of the Great Pamir Stream, and the last in the valley leading to the lake. Near it is the Hissār Fort, built on a solitary rock, standing out high on the plain, and said to be of very ancient date. We examined the ruins, and found them to show no signs of greater antiquity than those of Tāsh-Kūrgān, Sirikol. The mud used as cement in the walls indicated no great age. No hewn stones were seen in the whole place. The Mīr's eldest son, Ali Murdān Shah, visited us in the evening, at Langar-Kisht, to say good-bye.

From Langar-Kisht our road lay in a general north-easterly direction at some height along the slopes of the mountains on the right bank of the stream. The mountains on each side rise in a very gradual incline from the deep, rocky gorge in which the stream flows. The Zerzamīn and Mūtz streams join from the north at 8 and 19 miles from Langar-Kisht. The upper road to Shighnān leads up the latter. Bár Panja, the capital, is said to be reached in eight days by it, and Shākh Darrah in three days. Shākh Darrah was at one time a small independent Mīrship; but is now absorbed in Shighnān, similarly as Roshān. The Kirghiz, who formerly occupied the western end of the Great Pamir, are now located in Shākh Darrah, and visit the Alichor Pamir in summer.

The great Pamir appears to begin 25 miles above Langar-Kisht, and 39 from the lake. Its length from that point to the Aktāsh Valley is 108 miles, with an average breadth of 3 miles. The valley which, up to the point indicated, 25 miles beyond Langar-Kisht, is narrow, the base of the mountains approaching the bed of the stream opens out there, and the hills on either side show low and rounded. Thence the road lay in the same general direction over flats and long easy slopes the whole way to the lake. Birch and willow are plentiful to within 25 miles of the lake. From that point forward the never failing lavender-plant affords an abundant supply of fuel for cooking purposes. Excellent grass, similar to that in the Little Pamir, Aktāsh, and Sirikol valleys, is found throughout. The lake stream, in the first 16 miles of its course, flows between high, gravelly banks which rise to far-extending downs, dying away in the long and easy mountain slopes.

We reached the Great Pamir, or Wood's, Lake on 1st May. It was entirely frozen over, and covered with snow. Its water

is perfectly sweet, judging from what we used for two days high up, from the stream which flows out of it. It extends east and west, and is about 10 miles long by 3 broad. The water-marks on the shores, however, indicate a considerable enlargement in summer. The southern shore is even; the northern broken and irregular. The shores have all the appearance of a sea-beach from their sand and gravel covering. At 3 miles from the fort (western end) a high promontory runs out from the northern shore, and approaches the southern side to within less than a mile. The hills to the south slope very gradually from the edge of the lake, and the peaks rise to a height of 4000 or 5000 feet above it. Broad plains and low undulations, for about 3 miles, lie between the lake and the hills to the north, which appear much lower than those to the south.

Captain Trotter, to whom I am indebted for all my information as to elevation, after most careful observation, made the lake to be 13,900 feet above the sea, or 1700 feet less than Wood's height (15,600). Captain Trotter made his observations for measurement at the point of exit of the stream. I would here mention that Captain Trotter made Kila Panja to be 9090 feet, against Wood's 10,000 feet, at Hissar, 4 miles higher up.

The valley closes in at the head of the lake, and continues narrow for about 8 miles, when it again opens out with a steady fall to the east. Captain Trotter, by examination, determined the watershed to be, at this point, 14,200 feet, which we now regard as the culminating point of the Pamir tracts. Two small frozen lakes were observed at the head of the great lake, under the high, snowy mountains which close from the south. They presented the appearance of ice accumulations; and probably, after furnishing feeders to the lake for a short time, finally disappear in summer. A valley at the head of the lake leads to the Wurm Pass, by which the Little Pamir and Sarhadd are reached in one and two days respectively.

There was a great deal of snow about the lake, and it lay so deep on the high ground at its head, and in the valley leading down east from the watershed, that the easy, regular road that way could not be followed. We were, therefore, forced to seek a path along the low hills to the north, and had considerable difficulty in forcing our way through the heavy snowdrifts.

The snow ceased about 18 miles from the lake. The eastern stream from the watershed is there joined by a large one from 'Shash Darrah' (six valleys), in the range between Great and Little Pamirs. General paths lead from this point to the

Little Pamir and the Aktāsh Valley. Faiz Buksh, whom I have mentioned as passing over the Great Pamir in 1870, quitted the route that Wood and we took to the lake, and travelled along the hills to the north, reaching the lake above its head, and then crossed to the Aktāsh Valley by one of the paths leading from Shash Darrah. We followed the united stream, here called the Isligh, down to the Aktāsh Valley and its junction with the Aksū, over a gentle fall the whole way. The hills from that appeared low and rounded, with great openings and depressions showing everywhere. We were accompanied by a large party of Wakhis, acting as guides and in charge of the horses carrying our supplies. One of the guides, on being asked if paths lay in the direction of certain openings, said:—"Yes; there are paths all over the Pamir. It has a thousand roads; with a guide you can go in all directions."

The distance from the Great Pamir Watershed to the Aktāsh Valley is about 52 miles. From that point we travelled 18 miles, S.E. by S., up to the halting-place, which had been agreed upon with Captain Biddulph as the rendezvous on the 4th of May. Both parties reached punctually, we marching 37 miles that day to keep our engagement.

Captain Biddulph succeeded in visiting the Chitral Passes, and made a most valuable addition to our Pamir exploration. He found the approach to the Baroghil remarkably easy, the distance from Sarhadd short, and the pass to be about 12,000 feet high, which shows a wonderfully great depression of the Hindu Kush Range there. The rise from the inhabited portion of Sarhadd is only a little over 1200 feet. Captain Biddulph undertook this service by himself, and made the long journey back over the Little Pamir alone; doing all in the most complete and successful manner.

The Alichor Pamir runs east and west, parallel to the Great and Little Pamirs. According to Wakhi accounts it is similar in character to them: broad at the eastern and narrow at the western end. It is connected with the Great Pamir by the "Dasht-i-Khargoshi" (sometimes erroneously called Pamir Khargāshi), a desert flat, 20 miles long, which extends across from about 20 miles west of the Great Lake. A road passes along it, and branches from the Alichor to Shighnān and Khokand. A stagnant lake, called Tūz, and Sussik Kūl (salt-putrid lake), lies near the western end. The water of it was described to me as being salt to the taste. Abdūl Mejīd noted this lake as being at the first stage from Khargoshi, which agrees with the account given to us. A fresh-water stream rises east of Tūz Kūl, and flows into the Yeshil Kūl lower down

in the Alichor, from which another stream issues, and falls into the Mūrghāb, below its junction with the Aksū.

I have already mentioned the Sirīz Pamir when speaking of the Aktāsh Valley. This Pamir appears to be a continuation of that valley, similarly as the Little Pamir is, and as the Tāghdūngbāsh is of the Sirikol Valley. It seems to run from Ak-bālik in the east, to Bārtang in the west. Bārtang is the beginning of the inhabited and cultivated portion of Shighnān in that direction. It is described as abounding with fruit-bearing trees, and must, therefore, be much lower than Kila Panja, with a very different climate. It is easy to believe this when the long course of the Aksū-Mūrghāb, with a steady fall, is considered.

The Kirghiz spoke of the Rung Kūl, a large lake, about one day's journey from Ak-Bālik, and situated in the Sirīz Pamir. This, probably, is the Rung Kūl of Pamir Khūrd mentioned in Colonel Yule's Essay 'On the Geography of the Oxus,' the Aktāsh Valley and Sirīz Pamir being thus regarded as the Little Pamir, of which they are but the continuation, as I have already explained. By the Kirghiz accounts the Great Kārakūl is four days, the Little Kārakūl three, the Rung Kūl (one), and the Yeshil Kūl two-and-a-half days' journey from Ak-Bālik. I estimate the day's journey in these accounts at about 15 miles in a direct line. Abdūl Mejīd made 7 marches from Khargāshi to the Great Kārakūl. Of these probably one was to the Alichor, two down it to Ak-Bālik, and four up the Murghāb by the road which is said to traverse its banks.

The animals of the Pamirs are the *Ovis Poli*, ibex, brown bear, leopard, lynx, wolf, fox, marmot, and hare. They remain throughout the year, the bear hybernating for a long time in winter. The wild yāk is not known on or near the Pamirs. Wild-fowl swarms on the lakes in summer. We saw wild ducks and geese at the head of the Great Pamir lake-stream.

We were not fortunate in pursuit of game. On the way over to Wakhān the snow lay too deep to permit of sport, and on the way back our very limited supplies would not admit of a halt for the purpose. The only Ovis Poli obtained was one shot by Captain Trotter, on a long march of 37 miles. We saw very large flocks of this gigantic sheep on the Great Pamir. The horns of Ovis Poli and the ibex lie in great numbers on the Pamir. These animals suffer heavily from the leopards and wolves, which prey entirely on them. A murrain is also said to have made great havoc among both some years ago. The ibex are similar to the Himalayan species, and accordingly differ from those we saw in the Thian Shan Range, which were of the black species, also found in the Kūen Lūn. I brought

from the Great Pamir a pair of Ovis Poli, measuring 65½ inches round the curve, 53 inches in a straight line from tip to tip, and 16 inches round the base. I presented this splendid head to the British Museum, where it is now to be seen.

We experienced none of the symptoms of great height, headache, and difficulty of respiration, on the Pamirs in the degree that native travellers have described. None of our people suffered in any way beyond breathlessness when exertion was made.

There was perfect health among our party throughout the journey. One of the Wākhis who accompanied us with supplies over the Great Pamir died suddenly on the last march to Aktāsh from heart disease, and this was the only casualty or sickness even among the numbers of men who were attached to our camp when crossing and recrossing the Pamirs. All the natives of India with us bore the severe cold and hard work with remarkable endurance and courage.

The Pamir Plateau may be described as a great, broad, rounded ridge, extending north and south, and crossed by thick mountain-chains, between which lie elevated valleys, open, and gently sloping towards the east, but narrow and confined, with a rapid fall towards the west. The waters which run in all, with the exception of the eastern flow from the Tāghdūngbāsh, collect in the Oxus; the Aksū from the Little Pamir Lake receiving the eastern drainage, which finds an outlet in the Aktāsh Valley, and joining the Mūrghāb, which obtains that from the Alichor and Siriz Pamirs.

Our observations and inquiries show the true East and West Watershed of Central Asia in that quarter to extend from the head of the Tāghdūngbāsh, along the Neza Tāsh Range, to the Kizil Art Plain.

It is remarkable that, while we found the Little Pamir Lake not to be the source of the Sarhadd branch of the Oxus, we discovered it to be the source of a much larger branch of that river if taken in connection with the Mūrghāb. The messenger whom I sent from Wakhān with a complimentary letter to present to Eusuf Ali Shah, the Chief of Shighnān, at his capital, Bār Panja, on the left bank of the Oxus, found, on arrival there, that the Chief was at Wāmar, in Roshān, further down on the right bank of the river. He proceeded there, and on his way crossed at Wamar the Mūrghābi or Bartang River, near its junction with the Panja, as the Wakhān Stream continues to be called there. This name Panja the united streams carry to Kulab, after which the river is known as the Amū or Hāmu. The Mūrghābi at its junction was observed to be larger in volume and more rapid in current than the Panja.

The former was then (11th May) "thick, red, and muddy," while the Panja was "very clear." Captain Trotter has corroborative information regarding the greater size of the Mūrghābi over the Panja.

We saw hot springs at Patur, 35 miles below Sarhadd (temperature 130°), at Zong, near Kila Panja, and at Isligh, between the Great Pamir Lake and the Aktāsh Valley. We made repeated inquiries from Kirghiz, Wakhis, and Sirikolis, regarding "Bolor" as a name for any mountain, country, or place, but no one could give us any information of it, and the name is evidently quite unknown among them.

I have already explained how the name of a place has been mistaken for that of the Little Pamir Lake. A similar mistake appears to have been made in the name "Sirikol" given to the Lake of Great Pamir. When speaking of our journey up to the Lake, and inquiring about stages and distances, we were told of halting being possible at "Bun-Bekh and Payán-i-Kūl" (base, root or foot of lake), Mirján, and Barábar-i-Kūl (middle and half-way up the lake), and Bála and Sir-i-Kul (a base-head of the lake). Sirikūl was most frequently mentioned, being the usual caravan stage, and it was said in such a way as to lead easily to the idea of its being the name of the lake. When the guides were asked pointedly the real name of the lake, they answered "Kūl-i-Kulān "(the great lake), because there is no other lake in the country equal to it in size." Therefore the name Victoria given by Wood displaces no distinctive local one, and may well continue to be used without fear of causing confusion.

Regarding the name "Pamir," the meaning is wilderness—a place depopulated, abandoned, waste, yet capable of habitation. I was told this on the Great Pamir by one of our intelligent guides who said, in explanation: "In former days when this part was inhabited by Kirghiz, as is shown by the ruins of their villages, the valley was not all called Pamir as it is now. It was then known by its village names, as in the country beyond Sirikol, which being now occupied by Kirghiz is not known by one name, but partly as Chārling, Bas Robāt, &c. If deserted it would be Pamir." The Shewa Plain, a summer pasture resort to the north-west of Faizabād, Badakhshan, is also called Pamir by the people there. It is probable that in Marco Polo's time, and even in Abdūl Mejid's, the Kizil Art Plain was known as "Pamir," according to the meaning of the word as explained. The Kizil land was merely a summer pasture resort of the Kirghiz there, and was only permanently occupied about seven years ago. The difference of elevation between it and the Aktāsh Valley and the Alichor, Great and Little Pamirs, all

lying in the routes travelled, is comparatively small, and the absence of detail as to the flow of rivers, &c., led to belief in the existence of one far-extending "steppe" from Victoria Lake to the Alai range.

The meaning of Sirikol is generally believed to be "the yellow valley," but Hassan Shah, the governor, gave me his opinion that it is a corruption of "Sir-i-koh," as the valley runs up to a considerable elevation. On finding the valley to be a continuation of the Tāghdūngbāsh, I looked upon Hassan Shah's explanation as probably correct, from the fact of its being a literal translation of Tāghdūngbāsh, both meaning "head of the mountain." Nothing seems more likely than that the Persian-speaking Sirikolīs should, on settling in the valley, give it a Persian name, literally interpreting its Turki one.

Wakhān on the Pamir owns the western Tāghdūngbāsh from the watershed, the Little and Great Pamirs, and the left bank of the Aksū from the head of the Aktāsh Valley in the south, to Ak-Bālik in the north. The eastern boundary of Wakhān is conterminous with the western one of Kashghar from the Tāghdūngbāsh to Ak-Bālik, and Kashghar also owns the Kizil Art Plain, meeting the Khokand frontier at the Kizil Art Pass which leads to the Alai Plateau. Shignān owns the Alichor and Siriz Pamirs. There is no intermediate tract of country held by independent Kirghiz or other people; the whole of the extent from Herat on the west to Turfān on the east is held by Kabul and Kashghar.

We were very reluctant to leave the Kizil Art unexplored, but circumstances beyond our control compelled us to pass on. We retraced our steps to Tāshkūrgān, and after three days' halt there continued our journey towards Yarkand. We went by the Tagharma Plain, and the Kok Moinok Pass. We had a fall of snow at Chihil Gambaz on the night of the 14th of May, and cold weather till the 18th, when we were at once plunged into extreme heat at Egiz Yar in the plains. We arrived at Yarkand on 21st May, left on the 28th, and reached Leh on 29th June.

Three days after crossing the Kārakorum we suffered the deep affliction of losing by death one of our party, Dr. Stoliczka, a highly valued friend and talented companion. His death is a great loss to the scientific world, for is is not to be expected that his notes on geology, natural history, and other scientific subjects, can be presented to it in as perfect form as the author would have produced.

On our return to India, the Viceroy caused a letter, accompanied with valuable presents, to be sent to the Chief of Wakhān, in acknowledgment of his hospitality, aid, and protection

to us. It was mainly owing to this Chief's friendly assistance that we succeeded in our exploration. He was a very old man, and we found him, as I have mentioned, in a feeble state of health. It was a matter of great satisfaction to us that the letter and presents reached him before his death, which took place early this year.' The letter and presents were safely delivered by a trustworthy native officer, who proceeded with them from Peshawur, and replies were received from the old Chief and his son, Ali Murdān Shah, expressing much happiness at being remembered by their English friends. Ali Murdān Shah is now ruler of Wakhān.

What I have now said gives merely the observations of an ordinary traveller, as to what was seen and the information gathered by careful inquiry from many individuals of the different races and clans we met in our journey regarding the countries in the immediate vicinity of our routes. The geography of the scene of our travels has been ably and scientifically dealt with by Captain Trotter, of the Royal Engineers, and the result of the lamented Dr. Stoliczka's valuable researches in geology, botany, and natural history is now being prepared for publication under the orders of the Government of India.

XV.—*Journey to Lake Chad and Neighbouring Regions.* By DR. NACHTIGAL.*

IF I had not taken advantage of the opportunity afforded by a mission from the King of Prussia—the sending of presents to the Sheik Omar, Sultan of Bornu, science would not have received any benefit from this Expedition, since, if I had not decided to go, the Government would have entrusted a native with the conveyance of the presents. I held it to be my duty, therefore, as far as my feeble powers would allow, to serve the interests of geography and of knowledge. Our home Government, at that time, had no intention of adding any work of exploration to my mission; and as I was myself residing then in Africa, and had resolved on the journey only four weeks before starting, I travelled with the most modest resources, with the most incomplete outfit, and quite alone. Although I do not consider that this light equipment would be a disadvantage in journeys of discovery, properly so called—that is in travelling through or opening up perfectly unknown lands—

* Read before the Geographical Section of the British Association, at Bristol, August, 1875.

yet in this way the scientific results are limited to a correspondingly moderate scale.

I could thus make no astronomical observations; but I travelled with compass in one hand, and watch in the other, measured and counted paces, and thus reckoned the distances traversed, like my successful countrymen, Barth, Rohlfs, and Schweinfurth.

I could not make zoological, botanical, or mineralogical collections; and even when I was in a position to gather together some objects of interest, I was as frequently obliged, for the want of means of transport, to leave these behind me. I was, however, provided with thermometer, aneroid barometer, and hypsometer, to determine approximately the meteorological conditions and relative elevations of the countries passed through. The data obtained from these instruments are, for the most part, still in Africa, and have not yet been finally calculated. If, then, in spite of the preliminary character and incompletensss of my results, I venture to place some of these before you, I do so only to fulfil my duty in communicating as soon as possible something of what I saw and experienced to English geographers, who, from time immemorial, have rendered such great services to African geography. The qualifications which tended to lighten my undertaking were my knowledge of colloquial Arabic, and of Mohammedan customs—the indispensable requirements for communicating easily with men of such different modes of thought and feeling from ours; my knowledge of medicine, and, besides, a tough physical endurance, and a fair share of patience. It is no small thing to endure five years of life in the midst of a world of strange customs, and often without resources; to suffer a complete isolation; not infrequently under the numerous crosses and hindrances, and the yearly and unavoidable illnesses. Not only every spark of enthusiasm is extinguished, but all courage, hope, and energy, break down, apparently never to recover. It is not my intention here to give you any detailed account of my five years of travel; but I will confine myself to a compressed sketch of its chief features, and I will only examine more minutely some special districts and phenomena which may prove of greater interest. The incomplete results of my journeys, which comprise many separate expeditions, consist—

1st. In an opening up of the eastern half of the great desert which embraces the Tibbu countries.

2nd. In contributions towards the more perfect knowledge of Lake Chad and its tributary rivers; and of the Bahr el Ghazal, and the districts which surround it in the north-east from Kanem to Borku.

3rd. In the reported character of the heathen country south of Baghirmi.

4th. In the preliminary exploration of Wadai, and in information about the savage countries which border it on the south.

5th. In the similar exploration of Dar Fur.

In the spring of 1869, when, on my way from Tripoli to Bornu, I had reached the farthest Turkish province, the Fessan, I learned that there was no caravan about to proceed to Tropical Africa, since the direct trade between Bornu and the coast of the Mediterranean had for many years been greatly reduced. I was therefore compelled to make a dangerous and difficult journey to Tibesti, in the south-east of Fessan, where, however, I gained a closer knowledge of the Tibbu race and their country. Many of the geographers present may remember the accounts published by me at that time of *Tibesti*, the naked rock-land of "*Tu*," as it is called in the native language. Its chief characteristic is the summit of its knot of mountains, the broad-backed *Tarso*, which, according to an approximate determination, is 8000 to 9000 feet above the sea-level. It has on its summit a wide crater; its sloping sides are broken through by many granite-ranges and peaks, and on its eastern declivity there is a hot spring of high temperature. From it there radiates to north-west and south-east many irregular rocky chains and hill-groups of granite and sandstone, giving its configuration and direction to the whole country. On the south-west and north-east sides the river-valleys descend, and their deeply and sharply-cut channels testify to the violence of the rare showers of rain. These are the lines of vegetation and the centres of population, both of which, owing to the waste character of the country, are very scanty. The inhabitants, who hardly reach 10,000 in number, belong to the Tibbu family, and call themselves *Tedā*. They occupy a transition stage between the Berber and the Negro, and are of one race with the Southern Tibbu, the people of Borku, of Bahr el Ghazal, and partly of Kanem. They are distinguished from the last named by a difference of dialect, since they speak the "Mōdi Teda" of the Tibbu language, while the others use the "Midi Dāza." The Southern Tibbu may therefore be grouped under the name of "Dāza," although they are called "Gorăan" by the Arabs. Barth believed, from the reports given to him, that the *Wanya*, who live on the caravan-route between Baghazi and Wadai, belonged to the Tibbu race, as well as the Bidēyat," in the north-east of Wadai, and the "Zogháva," who are chiefly settled north of Dar Fur; but he was in error. Even though I have not been able to reach the seat of this race, yet individuals

of the family came so frequently under my notice, as to convince me that they form a race by themselves, a different one from that of the Tibbu. They are united by a common language, and stand rather more closely in alliance with the peoples of Tropical Africa than the Tibbu. It was only in the spring of 1870, after I had succeeded in escaping by night from the inhospitable land of Tibesti, where I had almost met my death, and after an inconceivably painful journey through the desert without a guide, almost without provisions, and with only a small supply of water carried on the shoulder, and after having reached Fessan half-dead, that I was able to continue my journey thence towards Bornu.

Arriving there at last, I discharged my mission, studied the country and people, learned the Bornu language, and was preparing for a journey to the Chad Lake, when a war between the King of Wadai and the ruler of Bagirmi overturned this project, and for the time closed to me the routes to the east and south-east. I therefore took advantage of the opportunity which offered to accompany an Arab horde belonging to the tribe of Aulad Soliman (which at this time were on a trade-visit to the market of Kuka, the capital of Bornu). These Arabs had settled in Kanem thirty-five years before, and were now on their journey back to their adopted country, the steppes of Egai and Bodele lying north-east of that, and to Borku, another chief district of the Tibbu region.

For nine months I travelled with these bandits—the fear of whom spreads far and wide—leading a monotonous and horrible nomad and robber-life, but one which afforded me opportunities of exploring the topography of these districts, and of extending our knowledge of the Tibbu family and its home; and especially enabling me to determine the character of the Bahr el Ghazal, and of the depressed plain of Bodele, to which last I will afterwards call your closer attention. I could not, indeed, reach the terminal point of my Tibesti journey; but from the northernmost hills of Borku I saw the mountain-chain which I had traversed in Tibesti, extending south-east as far as the country of the Wanya.

Having returned to Bornu in January 1872, I found that the war between Wadai and Bagirmi had come to an end; the king of the latter country, Mohammedu, had been vanquished, and was taking refuge in the savage lands of the south. King Ali of Wadai had returned to his country. I was now, therefore, in a position to carry out my original intention of exploring Wadai, the grave of Dr. Vogel. Yet it seemed to me to be more desirable, first, to trace upwards the course of the Shari River, and to study the chief tributaries of the Chad, for which

purpose the presence of the retreating King of Bagirmi seemed to afford a favourable opportunity.

I set out, therefore, at the end of the next month, February 1872, on this dangerous excursion through the war-torn country of Bagirmi, in which, the King of Wadai having imposed a new sovereign while the country generally remained true in its allegiance to the original king, a new civil war was being waged. I crossed the River Logon close to the capital of the district, reached the Shari near Bugoman, followed its course upwards for about 100 miles to Mafalin, turned then due south, and found the retreating king southward of the territory of Somrai, in the district of the Gaberi. I expected to find the ex-king in friendly relations with his former tributary subjects, but I was again, contrary to my will, compelled to make experiences of the slave-hunting which the king was prosecuting with the remnant of his former army, and in which I was perforce engaged for four months. Here I became acquainted with all the horrors of this scourge let loose over Africa, which has raised up those barriers to commerce and exploration which are so difficult to overcome in the unknown interior; and which in this case also prevented me from penetrating farther on my way. Along with these sad experiences I learned much of the Shari and its tributaries from the east, and about the union of its eastern branch—the so-called Ba Busso —with the western river of Logon; and here I arrive at the point which I wish to make the chief subject of my communication to-day: namely, the remarkable water-system of the Chad Lake.

This great central African depression is well worthy of our particular attention, since it has again and again been a centre of interest to geographers.

Denham, in his time, made it the object of his travels to explore its tributaries and outlets; it was also the goal of the English expedition of Richardson, Barth, and Overweg. Denham reached it from Kuka, and, travelling south and east, attained the very region in which the Bahr el Ghazal unites with the Chad. Barth and Overweg went round the northern apex of the lake, and Overweg navigated its interior waters and discovered its numerous islands. I, lastly, going in a northerly circle as far as the south-west of Mondo, and then in almost the same direction as Denham to south and east, came upon the Bahr el Ghazal at about two days' march from its connecting point with the Chad, and the same distance S.S.E. of Mondo, yet, under the circumstances in which I was placed on this journey, there could be no attempt at a regular survey of its shores. Lake Chad covers an area of about 500 German geo-

graphical square miles (10,500 English square miles), and is thus of about the same extent as the island of Sicily. Its form is that of an irregular triangle, the base of which extends from W.S.W. to E.N.E., but not in a straight line, since the delta-land of the Shari River invades the triangle at this point; another side lies more or less from it to south, forming the western shore of the lake; while the third, which runs not quite directly from north to south-east, forms the north-eastern bank. The interior does not consist of open water, or only in a relatively small proportion, two-thirds at least being occupied by land, which, from the net-like distribution of the waters of the Shari, falls into innumerable islands, which for the most part are inhabited. The open water stretches from the mouth of the river to west and north-west. It is much to be regretted that the lamented Overweg, the only one who has traversed the interior of the Chad, should have left such scanty information, that it is impossible from his report to estimate the true relation of land and water within it. Still it is a fact, that travellers going to Kanem in favourable seasons of the year, that is, in spring and summer, coasted the south-western course of the Chad, fearing the insecure state of the northern route, and as soon as they had passed the Shari, turned to the north, and reached Mondo through the territory of the Kanuri, without being aware that they had passed through a lake, because the branches which separate the islands are then at lowest water, and are quite passable for beasts of burden. On the central islands of the lake live the Budduma, who call themselves "Yedina"; on the eastern, live the Kanuri; and from the north-east shore several Kanembu families have migrated into the interior, since the occupation and ravages of the mainland of Kanem by Aulad Soliman have made it uninhabitable. Between the islands and in the open water the Budduma navigate about in their light boats, proving very dangerous to the shore-peoples, on account of their rapid movements and robbing propensities; but, nevertheless, they carry on some trade with these people, especially with those of the Kanembu tribes, in ivory and natron. This latter substance, although the waters of the lake are fresh throughout, is obtained in many places on the banks and islands, and is carried by the Bornu people across their country and the Haussa States as far as the Niger, and thence onwards to Illori.

The true banks of the Shari consist of sand-soil, and this is not uncommon in the lake-islands and on its shores. A deep black mud-soil, which is very difficult to pass in some seasons, is only met with on the low grounds close to the lake, which are flooded every year. From the shores of the Chad a view over

open water is rarely obtained; either the prospect is over a vast expanse of marshland, or the water is covered with a network of reeds and papyrus, and bounded on the horizon by a line of green islands. In the eastern portion one sees only land, with a network of waters when any higher ground affords a view. On the north-east shore, in obtaining reports of villages in the interior, the distance is given, with the additional information of the number of water-channels to be crossed.

The Chad is thus a vast lagoon, which has the most of its water in the western portion of it. There it is also rich in fishes and hippopotami; while, according to Overweg, animal life is scarce in the interior. The lagoon is fed from south and south-east by the Shari, from the west by the Komadugu Yaóbe, and from the south-west by the Komadugu Mbulu. Here I would note that the words Chad, Shari, Komadugu, and Ba, have each the meaning of river or collection of water; the two former belong to the different dialects of the Massa family, the third is Kanurish (or of Bornu), and the fourth is Bagirmi.

The Komadugu Mbulu, which falls into the Chad some days' journey south of Kuka, has for three-parts of the year only separated pools of water. It may be crossed in dry seasons dry-foot; but towards the end of the rainy season, and immediately afterwards, it requires to be passed by boat. Barth saw it in its upper course, on his journey to Adamawa, and calls it the river of Alaõ, which passes close by Dikoa, and generally contains water, but is only navigable for boats in the rainy season or immediately after it. The Chad Lake changes its outline continually; the lowest stage of its water occurs in the beginning of the rainy season, which in these latitudes occurs towards the end of June; it rises gradually during the second half of the rainy season; the last rainfall occurs in the beginning of October, and it reaches its highest stage in the end of November. These phenomena naturally follow along the south-western shores of the lake which are first exposed to the inundation, and which, in my journey to Bagirmi, I found more difficult to pass in the beginning of March than on my return in the beginning of September, at the height of the rainy season. I do not speak here, of course, of the waters which result directly from the rainfall, and which formed considerable hindrances in the way of our journey, but only of those parts which were flooded by the waters of the lake. When, in winter of 1872–3, I was travelling from Bornu to Wadai, the tracks along the shore of the Chad were impassable, and they remained so until February; we found difficulties enough indeed, even in the beginning of March. The first decrease of the waters was announced at Kuka, that winter, on the last days of December.

It is therefore a fact that the rain-water falling directly into the lake during July and August, and that brought to it by the Komadugu-Yaobe, and the Komadugu-Mbulu, from the immediate vicinity, does not suffice to swell the water of the lake, but that its actual increase is due to waters which come from a greater distance. *The Shari* is the chief affluent, and consists of a western and an eastern branch, which join at a distance of about 50 miles from their mouth in the lake. Of these, the eastern arm—the true Shari—(which is named Ba Busso, from the Bagirmi town of Busso on its banks) is the more important. Its volume and current are very variable, according to the season of the year. Below the confluence of its two branches, Denham found the river half-a-mile wide, and with a stream of two to three miles an hour, in the month of June; above the junction Barth found the true Shari, in March, to be 1800 feet broad, with a current also of two to three miles an hour; and near Bugoman, some distance farther up the stream, 1200 to 1500 feet wide.

From the last-named town I followed it upwards for about 80 miles, also in the month of March, and I found its width varying from 1000 to 1600 feet; half-way across it was fordable, and for a third part beyond, it was from 10 to 15 feet deep. Its bed is full of shallows and islands, and the people who had been driven out of the villages during the war, at the time of my journey in Bagirmi, had taken up their abode on these.

The western arm, the so-called river of Logon, is in ordinary circumstances a third smaller, with proportionately less current; and in March it could be waded across at the town of Logon. In the month of August, when I went down the corresponding portion of the eastern branch, I found it generally much increased, yet by no means in the same proportion as the western arm, which, when I crossed it, much exceeded the eastern in volume as well as in force of current. Barth saw both streams again in the month of August, and was also struck with this remarkable disparity in current. Now the reports I received from the natives of Bagirmi, as well as from the Southern people who live nearest it, and therefore should know best, go to prove that the eastern and western rivers are formed only by a separation of the main stream coming from the south-east; in the same way as the smaller arm, called Ba-Bachikam, divides from the Ba-Busso above that town, and rejoins its originating stream again at Miskin, near Bugoman.

Although I was not able to reach nearer than within four days' journey from the point of separation, yet I have laid down these branches of the river chartographically in a preliminary

way, and it thus appears that the whole of Bagirmi is included in the islands formed by the Shari. However, the native indications of hydrography, in which they introduce many fantastic ideas, must be received with great caution. I doubt much the accuracy of these reports, and the phenomena of the disproportionate rise and fall of the Ba-Busso and the Ba Logon cause me to think them somewhat improbable. If both streams were part of one river, they must swell at the same times, or else the branch which rises in so much greater proportion than the other, must receive tributaries after the bifurcation has taken place, which might cause the greater volume of water and the stronger current. The districts of the Musgo lying west and south-west of the river of Logon are, however, so flat that they are covered with swamp in many parts during the rainy season, so that at times a union seems to take place between the basins of the River Benue and that of the Shari by means of the lake, or rather swamp of Tuburi discovered by Vogel. Thus it is not probable that, after the reported separation, any tributary can come to the river of Logon from the westward, in such size as to increase in volume and current, and the existence of any bifurcation becomes consequently very doubtful. The only hypothesis which remains to be assumed is that of a separate source for each of the branches of the Shari which join at Kusseri. We come thus to the question of the origin of these. Whilst I was travelling from north-west, and passing up the Shari, seeking to discover its origin, and later, also, when I came from Wadai southward again to collect reports which might elucidate its water-system, the illustrious Dr. Schweinfurth was journeying south-westward from the Nile, and had reached the river of the Monbuttu, the so-called Uelle, becoming at once convinced that in it he had found the upper course of the Shari. He (Schweinfurth) says, "If the Uelle is not the Shari, whence can the volume of the latter river arise?" and to this he adds, "no noteworthy tributaries can possibly reach the Shari from the dry steppe-lands of Wádai and Dar Fur. While I was seeking information about the eastern tributaries of the Shari, in the south of Bagirmi, I obtained reports of four tributaries, of which the two more northerly flow in the territory of the Bua to the Ba Busso, or to its branch the Ba-Bachikam; the third was said to unite with the Ba-Busso, at a little south of the 9th degree of latitude; and the fourth was reported to enter about the 8th parallel into known country. The three former were said to be unimportant; but, as far as I could learn, the fourth, which is everywhere known as the Bahr el Ardhe, is a much more considerable river, and is always identified with the Shari.

Later, when in Wadai, I sought information about the hydrography of the country in the south, and I found the existence of these four tributaries of the Shari-system fully confirmed, both by the native merchants who carry on a little trade from Dar Kuti, in the south of the kingdom, with the Banda tribes, and by the officers of the king, who every year make slave-hunting raids in the south. The most northerly tributary gathers its waters from the slopes of the Marra Mountains in Dar Fur, where the numerous water-channels running south-west form the river known variously as the Bahr Sula, Om el Timan, Bahr el Tine, and *Bahr el Salamat,* which constitutes the southern limit of Wadai Proper, and afterwards loses itself, in great part, in the swamp of Iro; only a small portion of its waters going beyond this reach the Ba Bachikam, the above-noticed branch of the Shari. The second, which is larger in volume, is called Aukadebbe, and comes from the spurs of the mountainous country in the south-west of Dar Fur; it flows in a south-west and westerly direction through Dar Runga, in which it receives several tributaries from the lands of the Gulla and the northern Banda, and reaches the Shari between 9° 30′, and 10° s. latitude. It is reported to have water in its channel during the whole year, to be about 80 paces wide, and at low water to reach to the waist. The third, which is stated to be still larger, rises by two head-streams, the Bahr el Abiad and the Bahr el Azrek, from the mountainous districts of Dar Banda, flows W.N.W., and joins the eastern branch of the Shari in the territory of the Sara, not far from Sara Kumra. Both the Abiad and the Azrek have water always, and, according to the report of my servant who had accompanied a slave-hunting expedition as far as the Bahr el Ardhe, and who was trustworthy and intelligent, the passage of the river is generally not without difficulty. The River Azrek, according to this man, is 150 paces broad, and could not be forded even in the season of low-water; and the Abiad is from 250 to 300 paces wide, with water reaching to the chest.

The fourth, which is known as the Bahr el Ardhe, was reported by my servant to be more than 300 paces broad, and to have a strong current, which makes it difficult to cross; it is studded with islands, and although it was not very deep at that season, yet the number of boats used by the inhabitants showed its usual large size. One of my informants, an intelligent Bornu man, who had lived at Kuti for ten years, and who had travelled a great deal, had seen the sources of the river at Kaga (mountain) Banga, between 6° and 7° N. lat., and about the 21st meridian east of Greenwich, and was acquainted with its farther course. In volume he com-

pared it with the Shari, and was much inclined to identify it with that river.

North of the River Uelle, seen by Dr. Schweinfurth, there is still a considerable quantity of water flowing to the west and north-west. Does this suffice to form the two branches—the Ba Busso and Ba Logon—which, uniting, constitute the Shari? This appears to me also to be improbable; so much the more since we have just seen that the latter branch cannot receive any sufficient tributaries from west or south-west to explain its periodical increase of current and volume; I am, therefore, disposed to argue for the river of Logon a more distant source than that of the Eastern Shari, which, in my opinion, is to be found in the Bahr el Ardhe. I do not agree with Dr. Schweinfurth in speculating on a very distant tributary (from the Southern hemisphere), or rather, I do not believe that such a tributary exists, just as the reported rise of the Shari in March seems to me to be also an error.

If the reasons above given make it probable that the river of Logon has a distinct and independent source, this must lie near the River Uelle seen by Dr. Schweinfurth, the Kubanda River of Dr. Barth, or the Kuta, of which I obtained information, all which three appear to me to be identical. From information given me, this river flows to the west (near the 21st meridian east of Greenwich, and between the 5th and 6th parallels), and it has been described to me by men who have seen it as larger than the united Shari; it must therefore be much larger than the Ba Lagon. Still, apparently unaccountable increase and diminution of river-beds in Africa are not very rare phenomena, and I do not think that *this* disproportion is sufficient to preclude all possibility of an identification of the two rivers.

More interesting, perhaps, than the question of the origin of the Shari is this: what becomes finally of the water which it conveys into Lake Chad? Without doubt, the waters of the Chad lose much by evaporation, which is greatly aided by their shallowness and net-like distribution; yet it is easy to understand why an outlet has been sought for the Chad, as long as men of science in Europe have interested themselves in the lake. Such an outlet certainly does not now exist, and we are confined to the theory of *evaporation*. But there appears to have been one at no very ancient date.

From the south-east corner of the Chad, a broad, flat, wooded valley stretches for 30 English miles to the east; then it is turned to the north-east by the group of rocks and undulations which rise between the Chad and Fittri lagoon, and runs thence narrower and less wooded in the same direction, almost to where the sixteenth parallel crosses the nineteenth meridian

east of Greenwich, and there it loses itself in the district which slopes down into the fertile and pastoral plain of Bodele. Without considering its many bends and frequent tributary valleys, it has a length of 250 English miles. This valley or river channel, called the *Bahr el Ghazal*, has long been an object of attention to European geographers. Since it stretches north-east to the country of the Tibbu, as far as Borku, in which rocks are characteristic, one is at first sight inclined to think that the Bahr el Ghazal must slope from north-east to south-west, towards the Chad. The natives, on the contrary, maintain that this puzzling valley has the opposite slope; that formerly it always had water in it; and that the vast depression of Bodele, which also was formerly water-covered, was connected by it with the Chad. There are still some persons of the Kuri race living who have heard their grandfathers relate how they sailed to north-east with boats, in expeditions of rapine or war, and the Bahr el Ghazal itself, as well as the plains of Bodele and Egai, are covered with the dorsal bones of fish. In my journey with the Arabs of Kanem, through Kanem, Egai, and Bodele to Borku, I was able to prove the truth of some of these reports, and the results obtained must be regarded as the light which counterbalances the shadow side of ten months of nomad and robber-life. Ascending very gradually from the shores of the Chad in Kanem northward, the last well-station which is generally reckoned the limit of Kanem is reached a little south of the sixteenth parallel. Turning thence E. to E.N.E. and then N.E., the aneroid and boiling-point thermometer show a descent undoubtedly to below the level of the Chad. The wide rich pastoral plains of Egai and Bodele are then crossed, and again the land rises towards Borku in the E.N.E.

Egai is a long-stretching hollow, full of springs, and pasture, which slopes from north-west to south-east, without, however, reaching down to the Bahr el Ghazal; and Bodele is a system of shallow valleys, rich in little water-holes and isolated moving dunes. Bodele also slopes from north-west to south-east, and its deepest district appears to be where the Bahr el Ghazal loses the last trace of its "wady" characters. From north-east the river valley (called "Eunevi," καθ' ἐξοχήν, by the natives) named Djurab by the Arabs, slopes down into the south of Borku, and is also conspicuous in its desert neighbourhood by its pastures and wells. The whole of the land of this country thus presents a vast plain of basin-like hollows, embracing Egai on the south-west, and the southern districts of Borku in the north-east, and the lowest part of which fall in with the termination of the Bahr el Ghazal, in about 16° latitude and 19° east of Greenwich. This whole basin is scattered with fish-

bones, and seems to have been under water in the most recent times; then it must have been connected with the Chad, and appears to have been a sort of reservoir for the lake. How this drying up of the country has taken place, and how the communication between Chad and Bodele has been broken, I do not venture to decide. Formerly it was said that sand-hills prevented the passage of the water from the Chad into the Bahr el Ghazal; but this is scarcely possible, since in the rainy year of 1870 the waters of the Chad were driven for a distance of about 60 miles into the valley of the Bahr el Ghazal, so that a report was spread in the vicinity that it would again be covered with water as far as Bodele. Whether the Chad could suffer this loss of its outlet without modification of its form is another not less interesting question. Here I would remark that the Chad not only changes its limits in each season of the year, but that it also seems to have lasting changes of configuration. This is specially the case in the northern corner of the lake which has been traversed almost annually for thirty-five years by the Arabs of Kanem, who have found themselves compelled on every journey to make a wider circuit round the lake. The lake stretches out in this direction by advancing "Redzül" (or legs), which form wide bays, some of which are of such recent date that they have not yet received names. On the western shore, also, a general advance of the water seems to have taken place, and it appears to be invading the great layers of limestone in some districts as Barth formerly supposed. That the inhabitants of Kuka are persuaded firmly of the truth of a general advance of the waters appears most clearly from the following facts. During the year 1871–72, at the time of highest water of the Chad, the inhabitants of Kuka, and especially the Court circle, were in great fear lest their capital should be covered with the rising flood; and this anxiety had reached such a pitch in the end of 1872, that early in 1873 a new residence was decided upon by Sheik Omar and his courtiers. The beginnings of this new capital progressed rapidly; it was baptised "Cherwa," or the "blessed," and lies about two hours north of Kuka on a range of sand-hills. A similar advance of the water of the Chad has taken place near the town of Ngornu.

I hasten to a close, but I beg for a few moments still to glance at the remaining portions of my journey. In spring, 1873, I started, in spite of all warnings and prophecies of my friends in Bornu, for Wadai. This country had been from the beginning the chief object of my travels, and from Arabian merchants I had heard much good of King Ali.

I travelled along the west and south-west shores of the Chad

to the Shari, which I crossed at Gulfe, passed through the districts south of the lake which are only visited by nomads, as far as the rocky heights between the lake and Fittri, and traversing the territory of the Fittri once seen by Leo Africanus in its powerful state as the Bulala empire, reached Wadai Proper, through the countries of the Kuka, the Zyudi, and the Kondongo, and after a month's journey came as far as Abeshr, the capital of the country and the residence of the king, with whom I found every protection and support. King Ali, of the race of the Abassides, is a young, energetic, and intelligent man, who during his government since 1858 has won for his country a position of unusual power.

He has brought foreigners into his country, protected and encouraged traffic, and has extended his power and influence far beyond the limits of his kingdom. To the northward he rules over Wanyanga, a small part of Borku, and a large area of the Bideyat; he calls Fittri, Bagirmi, a part of Kanem and of the Bahr el Ghazal, his property; and southward he extends his sway over Dar Runga and Dar Kuti to the south of the Bahr el Salamat. In natural resources, in richness of land, in cattle, in population, and industry, Wadai is still behind Bornu, yet it excels in strong government, traffic with the Mediterranean coast, and in the warlike spirit of its inhabitants. The people of Wadai even surpass the people of Bornu in their hatred of strangers, in their rudeness, and general lack of civilisation.

The death of King Hassin of Dar Fur closed my route to the east for some time; so I turned once again to the south, in order to study the details of the hydrographic conditions of the extensive country of Dar Banda, and I returned only when I heard that the change of government in Dar Fur had passed over peaceably, leaving the track to the east free. Now only, in order to accomplish my return journey to Europe, in January, 1874, I was able to leave my royal protector of Wadai, and his residence. In four days I passed through the eastern limit of his kingdom, and entered upon the territory of another State, feared alike for its fanaticism and its hatred of foreigners, namely, Dar Fur, which previously had only been visited by two Europeans, the English traveller Browne, in the end of last century, and the French Dr. Cuny, more than thirty years ago. Browne, who had only seen Kobe and Fasher, the chief places of trade and foreign intercourse, brought back but scanty information with him; but Dr. Cuny died of illness in Fasher, and scarcely any of his reports reached Europe.

Coming from the far west, one ascends from the eastern shore of the Chad to the Marra Mountains. If we assume that the Chad lies about 800 feet above the sea-level, the capital of Wadai,

Abeshr, may be about 1500 feet in elevation, and calculating from that point, one may have attained on the western foot of the Djebel Marra the height of 2500 feet. From thence one ascends for a good day's march over the northern extremity of the mountains of Dar Fur, the pass-heights of which may be estimated at 3500 feet. On the second day one descends again to the plain; and the royal residence and capital of the kingdom, El Fasher, on the pool of Tendelty, may be still about 2000 feet above the sea-level. The Marra mountain is four days' journey long, or about a degree of latitude, and two and a half to three days' journey wide. It gives its character to the whole country, sending off numerous water-channels to W.S.W., and south especially, from which circumstance this part of the country is richest, most fertile, and most populated.

The river valleys which come from the northern extremity, and from the western slope of the mountain, collect the hill-waters of the rainy season to the above noted Bahr el Salamat. The rivers collecting the rain-waters of the eastern slopes, are prevented from finding an outlet to the Nile, in consequence of the absence of sufficient fall; Obeidh, the capital of Kordofan, still having an elevation of about 1700 feet. Only the rivers rising in the southern extremity of the Djebel Marra seem to reach the Nile through the Bahar d'Arab, the source of the River Homr. From the southern end of the mountain the watershed of the Nile and the Shari runs to S.S.W. through the territory of the Gulla and the Banda. Dar Fur is about half as large as Germany, and may have four millions of inhabitants. The riches of the country consist chiefly in cereals and in cattle; of the former, the Ducha (penicillaria) Durra (sorghum), the maize, and a small quantity of wheat, ground nuts (arachis and voandzeia), cotton, indigo, beans, and tobacco, are cultivated. The domestic animals are camels, cattle, horses, sheep, and goats. With the exception of wheat, Bornu might afford the greatest amount of cereals, and might also have the greatest number of cattle; its breed of horses is especially fine.

Dar Fur excels in agriculture, in its riches in wheat in the mountainous districts, as well as in its cultivation of tobacco. It surpasses its neighbouring countries, besides, in the quality and quantity of its honey.

Dar Fur has since ceased to be an independent State; the complications of the past year were brought to a catastrophe shortly after my departure. The brave King Brahir lost land and life in the battle of Mentowatsi; his uncle, the old Prince Hasseballa, retreated with the remnant of his fighting men into the mountains, but was soon compelled to throw himself at the feet of the victorious Khedive. Thus Dar Fur, the evil-reported

seat of fanaticism, has been opened up, by incorporation with Egypt, to strangers, and to civilisation. The land is fruitful, and in the north and east has a healthy climate for foreigners, so that when the well-known energy of the Khedive shall have prepared the way for commerce, its future has favourable prospects in connection with Egypt. For us, in Europe, the influence of the Egyptian Government, and through it of European civilisation, on the States and condition of the Sudan, is the best result of the conquest of Dar Fur. This is indeed the most important step that has ever been taken towards the suppression of the slave-trade, because Dar Fur does not alone come into consideration; its neighbour countries, Wadai and Bagirmi, are the two chief strongholds for the supply and export of slaves, and both are now more convenient to the direct influence of Egypt. Only when real results have been attained in this direction can we hope to see a peaceable commerce arising with the tribes of unknown Africa, and only then will the barriers fall which shut off the heathen lands of inner Africa from those of surrounding Islam, and then only will merchants and explorers and missionaries be in a position to fill out the great white patches in the map of Africa.

XVI.—*Notes accompanying a Chart of a Portion of the Niger Delta.* By Richard Doubleday Boler and Robert Knight.

After much experience in surveying the rivers and creeks, as shown by accompanying Chart, we are of opinion that these channels of the Delta of the Niger will greatly facilitate, at some not distant period, a very much more extended trade than there is at the present time, by giving easy access to steamers of light draught to the interior markets. At present business is carried on by tribes settling on the shore, who have neither the means nor the inclination to carry out measures to develop the enormous trade which the country can supply. These tribes act as brokers for the produce, and are very jealous of any interference with their markets, but, no doubt, before long the whole of the magnificent rivers, creeks, and lagoons, extending from Benin to Opobo, and forming the Delta of the Niger, will be opened and navigated by suitable steamers, developing the trade of the far interior.

The country from New Calabar to Brass we found, with rare exceptions, to consist of the usual mangrove-swamps, with their

dull sameness of straggling roots, mud, and dead green masses of foliage. The population consists only of scattered fishing-villages, with their little patches of land growing maize, bananas, plaintains, coco-nuts, and peppers; and we should not estimate them at more than 1000 souls in the whole distance of 100 miles. The channel would be available for any steamers of about 5 feet draught of water.

From Bonny to New Calabar the channel is constantly changing, and the banks abound with quicksands; but for vessels of larger size, and not over 10 feet draught, there is a good passage outside Breaker Island.

The River New Calabar, from the shipping to the oil-markets, affords a fine safe channel for vessels of fully 10 feet draught. After passing Ewaffa, which is some 45 to 50 miles from the mouth of the river, the country improves very much, the mangrove ceases, and moderately high land, well wooded, speaks of great capability for any tropic growth.

At Amaffa, say about 25 miles distant from Ewaffa, we found the country very good, and about 15 to 20 feet above high-water-mark. It is evident, from the profuse growth of everything, that the soil must be virgin in its richness. The natives seem poor and indolent, and are inclined to be troublesome. We think the poverty of appearance arises from the incessant quarrelling between tribe and tribe, as they are constantly plundering and capturing each other, the captives being always sold to slavery. In physique we think they are inferior to the men at the mouths of the rivers.

XVII.—*Notes to accompany a Traverse Survey of the White Nile, from Khartum to Rigaf.* By Lieut. C. M. WATSON, R.E.

THE journey from Cairo to Khartum, and up the White Nile to Gondokoro, is now so well known and has been so frequently and fully described, that it will be sufficient to make a very few remarks on the route which was followed on the occasion that the traverse survey of the river, which accompanies this paper, was made.

Having received instructions to join Colonel Gordon, C.B., on the Upper Nile, I left Suez, in company with Lieutenant Chippendall, R.E., on the 31st August, 1874, and we reached Suakim on the 5th September.

Leaving Suakim on the 11th of the same month, we arrived at Berber upon the Nile on the 24th. The route we followed

was not that which is usually taken by the merchants' caravans, and led over steeper and more rugged mountain-passes. This route has the advantage of being well supplied with water, which is found on each day's march, and is generally of good quality. The distance from Suakim to Berber by this road is about 270 miles.

For the greater part of the way, it leads over ranges of hills of volcanic origin, and across level tracts which have evidently been the craters of long-extinct volcanoes. These are of an irregularly circular form, and some are 12 or 15 miles across, and surrounded with steep, black cliffs. The surface is for the most part covered with sufficient soil to allow of the growth of a considerable amount of vegetation, and water is generally found by digging. Every now and then heaps of lava and scoriæ are passed, and trap dykes stand high above the surrounding level.

The highest pass which we crossed was rather more than 3000 feet above the sea.

Parts of this country are very beautiful, and would appear to possess great capabilities of improvement, if arrangements were made for preserving the water which falls during the rainy season.

After a few days' delay at Berber, we proceeded by steamer up the Nile to Khartum. The river was nearly at its greatest height, and navigation was consequently easy even at the cataracts which lie between Shendy and Khartum. At this point the Nile passes through a range of hills which contract its bed, and so increase the rapidity of the current. When the Nile is low, it is not possible to pass these rapids except in boats of very light draught, as there are many dangerous sunken rocks. The distance from Berber to Khartum occupied six days, but it can be done in from three to four without difficulty.

We remained a few days at Khartum, and then proceeded by steamer up the White Nile to Gondokoro, and reached it in thirty-four days. It was on this journey that the accompanying sketch of the river was made.

It may be interesting to explain the manner in which the traverse was laid down.

A 4-inch prismatic compass was placed in that part of the steamer where it was found to be least affected by the iron of the vessel, and a reading was taken at each alteration of the course of the steamer. The actual time on each course was also noted.

As the variation of this compass, of course, differed considerably as the direction of the head of the vessel altered, observations were taken as opportunities offered to ascertain the

actual variation corresponding to each course, and a table of variations was constructed.

The traverse was plotted day by day in a log-book similar in form to that proposed by Mr. Galton in his 'Art of Travel,' and all observations and notes were kept in the same book. The form is excellent, and most convenient in every way.

As the rate of the steamer was not known at starting, the courses were plotted on a time-scale, a quarter of an hour being represented by the fifth of an inch; and this was adhered to as being convenient, even after the rate of the steamer had been frequently ascertained. It was afterwards found that the scale adopted was nearly equivalent to 5 geographical miles to the inch.

A little difficulty was at first experienced in ascertaining, while in motion, the velocity of the stream, and the rate of the steamer. A patent log gave unsatisfactory results, as it registered the rate at which the vessel was passing through the water, and this was equivalent to the actual rate of progress added to the velocity of the current. It was, besides, so frequently stopped in its revolutions by floating vegetable matter as to be practically useless. The following method was therefore adopted, and is noticed, as others may find it useful.

The steamer was provided with iron stanchions, let into each bulwark, as awning supports. These stanchions were in pairs, one of each pair on the port bulwark, and the other on the starboard, and the line joining each two was exactly at right angles to the centre line of the vessel. Two pairs of these stanchions were selected, one pair forward and one pair aft, and the distance between them accurately measured.

Assuming that the vessel was moving ahead, and it was desired to ascertain her rate of speed, a tree or other fixed object on the bank of the river was chosen, and the exact time, to a second, at which the line joining the two forward stanchions passed it was noted, and also the time at which the line joining the two after stanchions passed the same object. The difference between the times being known, and also the distance between the stanchions, it is evident that the rate of the vessel can be ascertained by a simple computation. It is, in fact, a reversal of the well-known method by which the rate of a steamer is found on a measured mile.

To save trouble, a table was constructed which gave the rate of the vessel in knots per hour corresponding to each number of seconds which elapsed after the forward stanchion-line had passed any object until the after line had passed the same object. It is evident that the same method was applicable for ascertaining the rate of the current, by observing small floating

objects in the stream; numerous observations of this kind were made, and the mean results recorded.

The notes and remarks which are entered in the map, on each side of the river, are taken nearly verbatim from the log-book, in which everything of interest was recorded on the spot. Astronomical observations were taken at various stations from Fashoda to Rigaf. An 8-inch sextant, reading to 10″, was the instrument used. Whenever it was practicable, stars north and south of the zenith for latitude, and stars east and west for time, were observed. Six readings, at least, were generally taken. Lunar observations were made at Rigaf and Gondokoro, and the relative longitudes of the other stations were taken with a chronometer of which the rate was found to be fairly regular. These observations are all appended to this paper. An opportunity also offered for observing the transit of Venus on the 9th December, 1874, and the times of contact of the planet at egress were noted as accurately as the instruments at our disposal would allow.

Meteorological observations were also taken daily. The aneroid barometers used were checked at intervals by comparison with Captain George's mercurial barometers. These barometers are filled with great ease, and stand very rough usage without suffering injury.

The channel by which we passed through the marsh-district of the White Nile is the one formerly used, sometimes known as the Bahr-el-Gebal. The grass-barrier, which made it impassable for so many years, was cut through early in 1874, and the channel is now navigable without the least difficulty, though the width of open water is very small in some places. The Bahr-el-Zeraf, on the contrary, through which Sir Samuel Baker passed on his last journey to Gondokoro, is now said to be blocked up. It is probable that the directions of the channels through this mass of vegetation are constantly changing.

The great marsh may be said to end at Shambeh, or about north lat. 7°. From this point to Gondokoro the banks of the river are, for the most part, tolerably firm ground. In some places the river breaks up into a number of different channels, as will be seen on reference to the map.

At one place, between Bohr and Gondokoro, there is a large branch of the river, nearly as wide as the main branch itself, which flows away in a direction to the east of north. The Arabs say that it joins the River Sobat. This is a most interesting question, and it is hoped that it will be investigated.

We arrived at Gondokoro on the 14th November, and went on to Rigaf on the 29th of the same month. At that time the

wind began to blow steadily from the north and north-east. Sickness also appeared to increase at the same time.

May not this be due to the fact that the wind, passing over the great marshes which lie to the northward, and which are drying up at this season, becomes charged with malaria, and carries it to the comparatively healthy country in the vicinity of Rigaf?

There is now no Egyptian Government station at Gondokoro. The head-quarters of the province are at Lardo.

By the middle of November the Nile had fallen about 3 feet below the highest point of that season, and it continued to fall steadily until the end of January, 1875, when I left Rigaf to return to Cairo. For this reason the navigation was somewhat more intricate than when we ascended in November; but there was no real difficulty, and we reached Khartum in sixteen days after leaving Lardo. In many places the fall of the river had quite changed the character of the country, and districts which had been completely under water were now dry and covered with vegetation.

As the Nile was so low, that it was not possible for a steamer to get over the cataracts between Khartum and Shendy, we proceeded by camel to Berber, passing through Meroe, the ancient capital of Ethiopia, and crossing the Atbara, which had now become an insignificant stream, not more than ankle-deep. From Berber we continued to follow the road on the right bank of the Nile to Aboo Hamed, and thence across the Nubian Desert to Korosko on the Lower Nile.

The route from Khartum to Korosko is an interesting one. The journey took three weeks, including halts at Berber and Aboo Hamed. Of this time six and a half days were spent in crossing the great Nubian desert.

This route from Khartum to Cairo is the one usually followed by the merchants, although it occupies more time than that by Suakim and the Red Sea.

APPENDIX.

Results of the Astronomical Observations made by Lieutenant WATSON, R.E., *at positions on the River Nile during the year* 1874. *Calculated by* WILLIAM ELLIS, F.R.A.S., *of the Royal Observatory, Greenwich.*

TABLE I.—RESULTS OF THE OBSERVATIONS FOR LATITUDES BY CIRCUM-MERIDIAN ALTITUDES.

Date.	Name of Place.	Object.	Whether N. or S. of Zenith.	Separate Observation.	Resulting Latitude North.
1874.					° ′ ″
Oct. 23	Fashoda	α Cygni	N.	8	9 55 16
,, 25	Sobat	α Cygni	N.	8	9 23 12
,, 26	,, ...	α Cygni	N.	6	9 24 28
Nov. 3	Shambeh	α Gruis	S.	8	7 5 58
,, 3	,, ...	Fomalhaut ..	S.	8	7 6 0
,, 7	Canisseh	Sun	S.	6	6 46 23
,, 11	Bohr	Sun	S.	6	6 12 41
,, 23	Gondokoro ..	α Cassiopeiæ ..	N.	6	4 54 15
,, 23	,, ..	α Eridani	S.	6	4 54 37
,, 27	,, ..	Capella	N.	6	4 54 6
,, 27	,, ..	Canopus	S.	8	4 54 52
Dec. 4	Rigaf	α Cassiopeiæ ..	N.	8	4 44 1
,, 4	,, ...	α Eridani	S.	8	4 44 41
,, 5	,, ...	α Cassiopeiæ ..	N.	6	4 44 40
,, 5	,, ...	α Eridani	S.	6	4 44 56
,, 6	,, ...	α Cassiopeiæ ..	N.	8	4 44 16
,, 6	,, ...	α Eridani	S.	8	4 44 45
,, 10	,, ...	α Cassiopeiæ ..	N.	8	4 44 13
,, 10	,, ...	α Eridani	S.	8	4 44 42

latitudes . ,results contained in the preceding Table the following Table was

TABLE TABLE II.—CONCLUDED LATITUDES.

Name of Place.	Latitude North.	Number of separate Determinations.
	° ′ ″	
Fashoda	9 55 16	1
Sobat	9 23 50	2
Shambeh	7 5 59	2
Canisseh	6 46 23	1
Bohr	6 12 41	1
Gondokoro	4 54 28	4
Rigaf	4 44 32	8

TABLE III.—CHRONOMETRIC DIFFERENCES OF LONGITUDE.

(These results depend on the rate of one chronometer only.)

Names of Places.	Interval in Days between Observations for time at the Two Places.	Resulting Difference of Longitude.	
		In Time.	In Arc.
		m s	° ′ ″
Sobat, *west* of Fashoda	2	2 34·1	0 38 31
Shambeh, *west* of Sobat	8	3 20·3	0 50 4
Canisseh, *east* of Shambeh	4	1 22·8	0 20 42
Bohr, *east* of Canisseh	4	1 50·1	0 27 31
Gondokoro, *east* of Bohr	6	0 20·1	0 5 1
Rigaf, *west* of Gondokoro	7	0 17·5	0 4 22

TABLE IV.—RESULTS OF THE OBSERVATIONS FOR LONGITUDE BY LUNAR DISTANCES.

(The tabular distances given in the 'Nautical Almanac' have been corrected for the errors of the places of the moon and Saturn as determined from the Greenwich observations.)

Date.	Name of Place.	Object to which Moon was referred.	Whether the Moon was East or West.	Number of Measures.	Resulting Longitude East.
1874.					° ′ ″
Nov. 27	Gondokoro ..	Aldebaran ..	E.	3	31 1[illegible] [illegible]
,, 27	,, ..	Regulus	W.	3	
Dec. 15	Rigaf	Saturn	E.		
,, 15	,, ...	Aldebaran ..	W.		
,, 15	,, ...	*a* Arietis	W.	[illegible]	32 11 30
,, 16	,, ...	Saturn	E.	3	32 13 0
,, 16	,, ...	Saturn	E.	5	31 59 30
,, 16	,, ...	Saturn	E.	5	31 59 30
,, 16	,, ...	Aldebaran ..	W.	5	32 0 0
,, 16	,, ...	Aldebaran ..	W.	5	32 1 45
,, 16	,, ...	Aldebaran ..	W.	5	31 46 30

From the results contained in the preceding Table the following Table was formed:—

TABLE V.—SEPARATE DAILY RESULTS FOR LONGITUDE FROM LUNAR DISTANCES.

Date.	Name of Place.	Resulting Longitude for Moon. East of Object.			Resulting Longitude for Moon. West of Object.			Concluded Daily Means.		
1874.		°	'	"	°	'	"	°	'	"
Nov. 27	Gondokoro	31	15	45	30	59	0	31	7	23
Dec. 15	Rigaf	31	38	45	32	11	30	31	55	8
,, 16	,, ...	32	4	0	31	56	5	32	0	2

In the preceding Table there appears one result for Gondokoro and two for Rigaf. But, by the chronometric difference of longitude between Gondokoro and Rigaf contained in Table III., the one result obtained at Gondokoro may be reduced to Rigaf, and the longitude of Rigaf, as fundamental point, thus determined as follows:—

1874.		
Nov. 27	Longitude of Gondokoro	31° 7' 23" E.
	By Table III. Rigaf *west* of Gondokoro	0 4 22
,, 27	Inferred longitude of Rigaf	31 3 1 E.
Dec. 15	Longitude of Rigaf	31 55 8 E.
,, 16	,, ,, ...	32 0 2 E.

From which is adapted for the absolute longitude of Rigaf, 31° 39' 24" E. (mean of the three results).

With the adopted longitude of Rigaf, 31° 39' 24" E., and the chronometric differences of longitude contained in Table III., the longitudes of all the places included in that Table may now be deduced; and, adding thereto the latitudes from Table II., the following results are obtained:—

TABLE VI.—CONCLUDED LATITUDES AND LONGITUDES.

Name of Place.	Latitude North.			Longitude East from Greenwich.		
	°	'	"	°	'	"
Fashoda	9	55	16	32	19	7
Sobat	9	23	50	31	40	36
Shambeh	7	5	59	30	50	32
Canisseh	6	46	23	31	11	14
Bohr	6	12	41	31	38	45
Gondokoro	4	54	28	31	48	46
Rigaf	4	44	32	31	39	24

TABLE VII.—OBSERVATIONS OF THE EGRESS OF THE PLANET VENUS FROM THE SUN, IN THE TRANSIT OF VENUS ACROSS THE SUN, DECEMBER 8, 1874.

(Place of observation, Rigaf, latitude N. 4° 44' 32", longitude E. 31° 39' 24", as already determined. *See* Table VI.)

Phase observed.	Watch Time.		Watch fast of Rigaf Mean Solar Time.	Rigaf Mean Solar Time. (Astronomical Reckoning.)	
		H. ' "	H. ' "		H. ' "
Formation of black line	Dec. 8	20 35 26·0	0 27 19·6	Dec. 8	20 8 6·4
Internal contact * ..	,,	20 35 55 5	0 27 19·6	,,	20 8 35·9
External contact † ..	,,	21 4 52·0	0 27 20·0	,,	20 37 32·0

* Was a good observation.
† It was difficult to observe this with accuracy.

Report on the Calculations of Heights from Observations made by Lieutenant WATSON, R.E., *on the White Nile.* By RICHARD STRACHAN, Meteorological Officer.

Date.	Place.	Elevation above Sea Level.
1874.		Feet.
Oct. 9, 10	Khartum	1414
Oct. 26, 27, 28	Sobat	1427
1875.		
Feb. 6	Bahr el Gazul ..	1476
1874.		
Nov. 11 days	Gondokoro	1785 {Mean of 11 days.
Nov. 19, 21	,, ...	1774
Dec. 4	Rigaf	1775
Dec. 21 days	,, ...	1719 {Mean of 21 days.

These heights have been calculated from observations made with mercurial barometers of Captain George's pattern for travellers. The original observations are stated to have been corrected for instrumental errors. Where a number of observations have been made in the same month, the means of them have been used as the data for the upper station. The barometrical observations have been reduced to temperature 32°, by the table for graduations on glass scales, these barometers being divided on the tubes themselves. The air temperatures have been taken as correct. The following are the data used for the sea-level: the pressure having been obtained from Buchan's isobarometric charts, and the temperature from Dove's isothermal charts:—

Month.	Pressure.	Temperature.
	Inches.	°
February	29·9	81·5
June	29·8	82
July	29·8	81
September	29·8	81
October..	29·9	80
November	29·9	79
December	29·9	78

Considering that the data for the sea-level must be subject to some uncertainty, it has not been deemed advisable to apply any correction for the diurnal range of the barometer. Hypsometrical observations have also been made with evident care. But, as the hypsometer can only be regarded as a substitute for the mercurial barometer—the calculation of heights from its indications depending upon the barometric formula—it should, when read with the barometer, be considered a check, and preference should be given to the barometer. Mercurial barometers are not liable to errors, which are of much importance in measuring elevations: on the contrary, hypsometers change their corrections by the rise of the zero point due to use and age, and a small unknown error causes a great difference in the heights. It would, therefore, be of little use to calculate these heights from the hypsometer's readings. The two series would merely serve to show by their differences that either the barometers or the hypsometers were not correct. These differences have been calculated by a shorter process, and it is interesting to notice how consistently they tell the same tale. They are as under:—

Place.	Date.			H.	B.
	Y.	M.	D.	°	Inch.
Khartum	1874	10	9 ..	- 0·30	+ 0·171
,, ...	,,	6	6 ..	- 0·20	+ 0·115
Mouth of Sobat ..	,,	6	22 ..	- 0·18	+ 0·101
Mouth of Gazal ..	1875	2	6 ..	- 0·19	+ 0·109
Shambeh	1874	7	— ..	- 0·30	+ 0·174
Bohr	,,	7	— ..	- 0·27	+ 0·155
Gondokoro	,,	10	21 ..	- 0·21	+ 0·121
,, ...	,,	11	19, 21	- 0·22	+ 0·123
Rigaf	,,	9	21 ..	- 0·20	+ 0·112
,, ...	,,	12	4 ..	- 0·21	+ 0·121
MEANS				- 0·228	+ 0·130

Error in heights due to H = ·228 × 527 = 120 feet.
,, ,, ,, B = ·130 × 92 = 120 ,,

The column H is the correction due to the hypsometers on the supposition that the barometers were accurate; B that due to the barometers taking the hypsometers as correct. The mean correction H shows that the hypsometers would have given heights on an average 120 feet lower than those deduced; the mean of B, that if the barometers are so incorrect the heights ought to be reduced by about 120 feet. However, it is scarcely possible for the barometers to have been incorrect to anything like this extent, while the correction for the hypsometers is not only possible but very probable. It would be interesting to have the instruments tested at the Kew Observatory. If this could be done, and the results should happen to support the inferences here made, it would afford a valuable confirmation of the theoretical accuracy of the Tables

founded on the barometrical formula of Laplace, and the vapour tension formula of Regnault.

It may be noticed that the corrections actually applied to the readings of the hypsometers average about + 0·2; and consequently the residual correction deduced now seems to show that their zeros have risen, so that now they are really more accurate than they were originally, the plus and minus corrections being almost nil.

The comparisons instituted between the barometer and hypsometer observations afford a convincing proof of the fidelity with which the observations have been made.

METEOROLOGICAL OBSERVATIONS taken on the WHITE NILE, between KHARTUM and RIGAF, 1874.
By LIEUT. WATSON, R.E.

Date.	Place.	Barometer corrected for Instrumental Error.			Temperature in Shade.								Wind.		Weather.
					A.M. 8.0		Noon. 12.0.		P.M. 8.0.		Max. Day.	Min. Night.	Direction.	Force.	
		A.M. 8.0	Noon. 12.0	P.M. 8.0	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.					
1874. Oct. 9	Khartum	28·58	..	..	83	72	..	..	..	..	..	..	..	..	Fine.
,, 10	,, ...	28·66	..	..	77	68	..	..	..	..	..	..	..	..	Fine.
,, 11	On White Nile ..	..	..	28·58	..	..	..	..	86	75	..	..	N.W.	4	Heavy rain at night.
,, 12	,, ..	28·67	..	28·57	80·5	73	87·5	76·5	89	89	..	..	N.W.	3	Fine; rain at night.
,, 13	,, ..	28·64	..	28·58	83·5	75	90·5	77	87	..	..	..	N.W. W. S.W.	2 3	Heavy clouds and lightning; a little rain.
,, 14	,, ..	28·63	..	28·63	82·5	74	93	75	88	..	..	..	S.W.	2	A little rain.
,, 15	,, ..	28·67	..	28·66	79	72	91	73	85	..	..	..	W.S.W.	3	Fine.
,, 16	,, ..	28·65	..	28·58	89	74	93	76	89	78	..	..	W.	1	Very fine.
,, 17	,, ..	28·53	..	28·66	89	75	..	..	82	73	..	..	S.E.	4	Cloudy; lightning.
,, 18	,, ..	28·70	..	28·65	79	75	87	77	84	75	..	..	S.E.	1	Fine.
,, 19	,, ..	28·60	..	28·64	78	75	90	77	76	73	..	..	S.E.	2	Fine in morning; heavy rain in evening.
,, 20	,, ..	28·70	..	28·70	79	75	94	78	78	71	..	..	S.	5	Fine.
,, 21	,, ..	28·70	..	28·64	76	73	85	77	76	73	..	..	S.	3	Fine.

,,	22	,, ..	28·67	..	28·58	76	71	85	70	78	74	..	..	S.E.	2	Fine.
,,	23	,, ..	28·61	..	28·55	82	68	89	74	79	73	..	..	S.E. / E.N.E.	2 / 6	Fine. / Squall in evening.
,,	24	,, ..	28·67	..	28·55	..	..	85·5	77	77	73	..	..	S.	3	Fine.
,,	25	,, ..	28·66	..	28·64	78	74	84	77	79	74	..	..	S.	1	Fine.
,,	26	Sobat	28·64	28·58	28·61	80	73	86	75	78	74	..	..	S.E.	2	Fine.
,,	27	,, ...	28·67	28·60	28·55	78	75	87	77	80	75	..	..	S. / S.E.	3	Fine.
,,	28	,, ...	..	28·57	28·60	..	..	88	78	79	75	..	..	S.E.	2–6	Heavy rain and lightning in afternoon.
,,	29	On White Nile ..	28·67	28·60	28·63	78	74	86	78	74	71	..	..	S.	5	A little rain.
,,	30	,, ..	28·67	28·65	28·65	78	74	87	79	80	76	..	..	S.	2	Fine.
,,	31	,, ..	28·70	28·66	28·65	78	75	86	78	..	..	..	..	S.E.	4	Cloudy.
Nov.	1	,, ..	28·67	28·61	28·60	79	75	87	77	78	75	..	..	S.	2	Fine.
,,	2	,, ..	28·62	28·60	28·55	82	76	83	76	82	76	..	..	S.E.	2–3	Cloudy; fine.
,,	3	,, ..	28·62	28·60	28·59	77	74	85	76	82	75	..	..	S.	2	Fine.
,,	4	,, ..	28·64	28·61	28·58	83	76	86	76	77	74	..	..	S.E.	4	Threatened rain.
,,	5	,, ..	28·62	28·57	28·53	80	75	87	77	79	76	..	..	S. / S.E.	3	Cloudy.
,,	6	,, ..	28·61	28·59	28·57	78	75	..	..	73	71	..	..	N.E. / E.	2 / 4	Very cloudy.
,,	7	,, ..	28·60	28·58	28·57	76	72	87	..	..	73	..	..	N.E.	3	Fine.
,,	8	,, ..	28·57	28·53	28·54	79	75	86	76	75	71	..	..	E. / S.E.	2	Fine morning. / Rain at 4 P.M.
,,	9	,, ..	28·60	28·60	28·55	75	72	83	76	74	71	..	..	S.E.	3	Cloudy.
,,	10	,, ..	28·61	28·59	28·52	77	73	84	74	74	70	..	..	S.E.	2	Cloudy.
,,	11	,, ..	28·58	28·56	..	78	73	88	76	..	..	..	..	S.W.	2	Fine.
,,	12	,, ..	28·54	28·49	28·40	80	71	86	73	78	71	..	..	S.E.	4	Fine.
,,	13	,, ..	28·50	28·46	28·41	78	74	87	75	80	74	..	..	S. / S.E.	2–3	Very fine.
,,	14	,, ..	28·47	28·42	28·40	77	74	..	..	80	75	..	..	E. / S.E.	2–3	Fine.
,,	15	Gondokoro	28·42	..	..	79	74	..	..	..	..	..	..	S.E.	2	Fine.

METEOROLOGICAL OBSERVATIONS taken on the WHITE NILE, between KHARTUM and RIGAF, 1874. By LIEUT. WATSON, R.E.—*continued.*

Date.	Place.	Barometer collected for Instrumental Error.			Temperature in Shade.								Wind.		Weather.
		A.M. 8 0	Noon. 12.0	P.M. 8 0.	A.M. 8:0 Dry.	A.M. 8:0 Wet.	Noon. 12.0 Dry.	Noon. 12.0 Wet.	P.M. 8.0 Dry.	P.M. 8.0 Wet.	Max. Day.	Min. Night.	Direction.	Force.	
1874.															
Nov. 16	Gondokoro	..	..	..	..	..	..	..	..	..	..	..	..	..	Fine.
,, 17	,, ...	..	..	..	..	..	..	..	..	..	..	..	..	..	Fine.
,, 18	,, ...	..	..	..	..	..	..	..	..	..	..	..	..	..	Fine.
,, 19	,, ...	28·43	28·29	28·38	76	71	87	..	83	..	..	..	N.E.	3	Fine.
,, 20	,, ...	28·43	28·34	28·36	83	73	93	76	77	71	..	70·5	E.	2	Very fine.
		A.M. 9.0	P.M. 3.0	P.M. 9.0	A.M. 9.0		P.M. 3.0		P.M. 9.0						
,, 21	,, ...	28·42	28·28	28·36	86	75	92	76	77	69·5	93·5	73	N.E.	2	Fine; cloudy.
,, 22	,, ...	28·46	28·32	28·33	80	72	91	72	78	69	93	69	N.	3–4	Foggy in evening.
,, 23	,, ...	28·39	28·23	28·32	84	71	95	72	76	70	95	70	N.E.	2–4	Fine.
,, 24	,, ...	28·37	28·21	28·24	88	69	93	70	77	70	93	69	N.	3	Fine.
,, 25	,, ...	28·27	28·25	28·33	82	70	96	76	79	69	96	67	N.E.	2	Fine.
,, 26	,, ...	28·41	28·30	28·36	82	72	94	75	76	68	96	71	N.E.	2	Fine.
,, 27	,, ...	21·46	28·34	28·45	81	71	90	76	80	71	92	70	N.E.	2–3	Fine.
,, 28	,, ...	28·48	..	..	80	70	..	..	..	..	..	..	N.	2–4	Very hot day.
,, 29	On White Nile ..	..	..	..	..	..	..	..	..	..	..	..	E.; S.E.	2–3	Fine.
,, 30	Rigaf	..	..	..	..	..	..	..	..	..	..	..	S.E. N.E.	2 4	Heavy rain at noon. Fine evening.

Dec. 1	,,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	S.E.	3	Fine.
,, 2	,,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	E.	2	Rain at night.
,, 3	,,	..	..	..	28·44	28·32	28·40	84	74	85	70	80	71	..	71	N.E. / S.E.	2 / 3	Fine.
,, 4	,,	..	..	..	28·43	28·29	28·32	83	71	91	72	80	72	91	69	N.E.	3–5	Squally.
,, 5	,,	..	..	..	28·42	28 29	28·29	81	70	94	73	81	73	94	69	N.E.	2–4	Cloudy; close.
,, 6	,,	..	..	..	28·43	28·32	28·39	83	69	93	72	84	72	96	72	N.E.	2	Fine.
,, 7	,,	..	..	..	28·48	28·32	28·35	80	68	94	73	..	..	95	73	E.	3	Fine.
,, 8	,,	..	..	..	28·45	..	28·36	79	73	..	..	85	69	93	70	E.	3	Fine.
,, 9	,,	..	..	..	..	..	..	83	72	..	..	84	70	95	68	S.E.	2	Rather cloudy.
,, 10	,,	..	..	..	28·42	28·28	28·34	86	70	94	74	81	70	94	68	N.E.	4	Fine.
,, 11	,,	..	..	..	28·43	28·26	28·34	87	70	90	72	80	68	90	70	E. / S.E.	2	A little rain.
,, 12	,,	..	..	..	28·41	28·27	28·33	82	72	94	73	..	..	94	69	E.	2	Fine.
,, 13	,,	..	..	..	28·41	28·26	28·34	83	70	93	73	84	69	93	70	N. / E.	4	Fine.
,, 14	,,	..	..	..	28·43	28·27	28·30	81	69	96	73	..	..	96	70	N.E.	3	Fine; rain in afternoon.
,, 15	,,	..	..	..	28·39	28·28	28·31	84	72	95	71	82	70	95	70	E.	2	Very fine.
,, 16	,,	..	..	..	28·38	28·26	28·31	84	68	92	72	82	70	96	71	E.	2	Fine.
,, 17	,,	..	..	..	28·37	28·25	28·29	83	69	95	74	81	71	97	71	N.E.	4	Fine.
,, 18	,,	..	..	..	28·37	28·24	28·30	84	71	95	72	83	70	98	70	E.	0–1	Fine.
,, 19	,,	..	..	..	28·40	28·25	28·29	85	68	97	73	80	71	98	68	N.E.	2	Fine.
,, 20	,,	..	..	..	28·42	28·30	28·31	81	68	94	71	84	70	95	67	N.E.	3	Fine.
,, 21	,,	..	..	..	28·44	28·32	..	81	68	94	72	..	..	98	65	N.W.	3–4	Fine.
,, 22	,,	..	..	..	28·45	28·30	..	..	..	95	71	..	..	96	..	N.E.	2	Fine.
,, 23	,,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
,, 24	,,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
,, 25	,,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
,, 26	,,	..	..	..	28·42	28·25	28·28	84	69	97	70	83	70	99	70	N.E.	2	Fine.

XVIII.—*Note on Lieut.* Grandy's *Map of his Journey from Ambriz to San Salvador and the Congo.* By W. J. Turner, Assistant Map-Curator R.G.S.

[The Council regret that the leader of the 'West Coast Livingstone Search Expedition,' in addition to the Personal Narrative printed in the 'Proceedings,' did not furnish any account of the Geographical Results of his journey, such as might have been fittingly published as a paper accompanying the Map now given to the Fellows. Such a paper was due to the interest of the subject and the liberality with which the cost of the Expedition was defrayed by Mr. James Young, of Kelly. In default, the following account by Mr. Turner of the cartographical material extant regarding the interior of the country traversed by Lieut. Grandy, will be found a useful accompaniment of the Map.]

On the return of Lieut. Grandy to England, he read to the Society a general narrative of his journey, promising to supplement it with a more detailed and scientific account for publication in the 'Journal,' in which case this map would have served as an illustration. Such a paper, however, has not been supplied, but it would be a matter of great regret to leave unpublished, for want of a descriptive account, the cartographical material he left with the Society, considering that he so materially alters the topography of the country from that which is at present accepted.

The only maps of this region are Viscount Sa da Bandeira's map of Angola, by Ferd. Costa Leal, 1863; and another by Dr. Petermann, published in the 'Mittheilungen,' 1862, and again in 1875—the former of these does not extend north-east of San Salvador, and appears to have been compiled from the itineraries of traders, and is altogether devoid of any detailed topographical rendering; whilst the latter, which has been constructed from the information of Dr. Bastian, in 1857, and that of the missionaries in the sixteenth and seventeenth centuries, is upon a comparatively small scale, and is very erroneous both as regards positions and topography.

The map which I now submit has been carefully reduced from Lieut. Grandy's original field-map (still in the Society's possession) on 37 sheets, scale 1 inch = 1 mile, connected with the new Survey of the Congo, and the coast as laid down on the most recent Admiralty charts.

XIX.—*On the River Quanza.* By Carl Alexanderson.

The River Quanza forms the south-eastern boundary of the Portuguese province of Angola. Its source as yet is unknown.

From Dondo to the bar it is the great commercial highway of Angola, but only navigable for small craft, owing to its great shal-

lowness during part of the year. Trade is very brisk at the different factories on the right bank of the river, the left one being still in the hands of the natives, who will allow no Europeans to settle there. An exception is the small fortress of Muxima held by the Portuguese, but no trade comes to that place. Dondo may be called the heart or capital of the interior of the province of Angola. To Dondo the Portuguese traders and planters of Cazengo, Golungo-Alto, Ambaca, Pungo-Andongo, and Malange send their coffee, wax, rubber, and ivory to be shipped to Loanda. It is to Dondo the natives from the right bank of the Quanza bring their ginguba and those from the left bank their palm-oil, to be bartered against cloth, powder, arms, rum, and quincalleries.

We have two seasons, a summer and a winter, the latter from the beginning of June to the middle of October, and the former from the middle of October to the beginning of June. In winter (also called the dry season) we have no rains but heavy dews during the night, and with the sun generally obscured by clouds until 9 A.M. The temperature is agreeable, the thermometer seldom rising above 22° R. in the shade. The summer or rainy season is more properly divided into two seasons: the small rains and the big rains. On the 18th of October, when we have the sun in our zenith, small showers begin to fall in the afternoon until the 22nd of December, when the sun attains its greatest southern declination; from that date until the 24th of February, when we again have the sun in our zenith, the weather remains changeable, while in March and April the rains come down in heavy showers of sometimes twelve and sixteen hours' duration, inundating the country and swelling the rivers.

The banks in the river, as well as the bar, shift yearly after the rainy season is over, owing to the strong current occasioned by the heavy rains; I have laid them down in the chart as I found them at the time of my survey. The soundings are for the months of August and September (the driest during the year). After the middle of October the river begins to rise gradually until the end of March, when it is at its highest, remaining more or less stationary until the end of April or middle of May, when it gradually begins to fall again.

During the dry season, a flood tide is felt as far as Bom Jesus, while in the rainy season a current runs constantly down with a velocity of from 4½ knots at Dondo to 1½ knot at the bar.

The climate on the banks of the river is not healthy, fevers and liver complaints being the prevailing sicknesses; the rainy months being the worst ones. When the river has overflowed its banks and subsides again into its own bed, the effluvia from the ground becomes very dangerous to European as well as to native

constitutions. It is remarkable that the natives suffer as much, if not more, from fevers than the Europeans; in fact, my opinion is, that a regularly and well dieted European has a better chance in this climate than the greater part of the natives, who live almost entirely on farinha and fuba, and poison themselves with the vile stuff called rum, imported by European traders.

The moment the traveller from Dondo into the interior arrives on the first plateau, he already breathes a fresher air, and in Cazengo, Pungo-Andongo, Golungo-Alto, and Ambaca, fevers are almost unknown, while the climate of Malange is almost European, wheat growing there.

Two years ago a terrible epidemic of small-pox decimated the native population, while not a single European was attacked by it.

In case of sickness a native generally distrusts European treatment and medicines, but prefers to be slowly doctored to death by his own countrymen, and superstition.

When dead, the common negro is buried anywhere, maybe a few yards off the door of his cubata or in the middle of the road. Sobas, or native chiefs, are interred with more ceremonial. For three months the corpse is kept above ground, sitting in a chair, and daily enveloped in more and more pieces of cloth, which are robbed on the highway by his former subjects. After this lapse of time, he is deposited in his grave, two grown-up slaves being decapitated and their bodies interred with him, as well as a boy and a girl (both alive), the former holding the Soba's pipe and the other a vessel with water. Though I have never been an eye-witness to this barbarism, and though it is officially contradicted, I firmly believe that it is still practised. Another barbarism not yet abolished is judgment by fetish; viz.: the accused, to show his innocence, deliberately swallows a certain amount of a deadly vegetable poison; if he vomits it out he is innocent, if his stomach retains it he is guilty of the crime imputed to him, and dies. When a Soba dies, his successor is not allowed to continue works which the deceased may have begun, or to inhabit his residence, nor does he inherit his furniture, plate, or anything. On the contrary, whatever immovable goods (houses, &c.) belonged to the deceased, are allowed to fall into ruin, while all movable goods are robbed by his subjects immediately after death. For a whole year the spirit of the deceased is supposed to reign, his successor having no power whatever; the whole kingdom or tribe remains, therefore, in a state of anarchy. This antiquated custom impedes, to a great extent, the prosperity of the native tribes, as whatever one regent may have done for his people, his successor is obliged to annihilate.

Next to Dondo the most important places on the Quanza are

Massangano (fortress, trade, and cane plantations on the Lucala); Boca da Quanza (trade principally oil); Cunga (trade principally cotton); Bom Jesus (large cane plantation, which was totally destroyed by last year's flood); Calumbo (Portuguese chefado, but otherwise unimportant); and Tombo as firewood depository. Besides these more important places, the right bank of the Quanza is thickly lined with native villages, whose names I have given in the chart, in the best way in which I was able to translate the native pronunciation into a written word.

A stranger must not attempt to cross the bar without having previously been in with a boat to sound the channel. During the stormy months of the South Atlantic (June, July, August, and September) frequent heavy rollers render the navigation over the bar extremely hazardous. As these heavy rollers often come in on perfectly calm days, I presume they are occasioned by gales either at the Cape of Good Hope or at Cape Horn.

XX.—*Notes to accompany a Survey of the White Nile from Lardo to Nyamyungo.* By COLONEL C. G. GORDON, R.E., C.B.

THE River Nile is navigable for boats at all seasons, from Lardo to Bedden, and during three parts of the year it is navigable for steamers of moderate draught to a point within three miles of Bedden. But in the dry season steamers cannot proceed higher than Gondocoro.

The road by land from Lardo to Rigaf, and from Rigaf to Bedden, is through well cultivated undulating country.

From Bedden the river is navigable for boats to Kerri, but the rapids at Bedden necessitates a transhipment at that station. The road between these two points by land is through an open country, sloping gently down to the river. Two considerable streams are crossed, one of which, the Lima, is generally knee-deep, but after storms is impassable. It has a steady current. The second, the Kya, is a torrential stream, and always dangerous to cross.

After passing the Kya, the country becomes more rugged, and this continues on both sides of the Nile, until near Kerri, where it opens out again, and continues open to near Laboré.

The river from Kerri to Laboré cannot be termed impassable. There are some awkward rapids in it, but they would soon become known, and the river might be utilised to a great extent. The land road is good, and through cultivated country.

At Laboré the country comes down more abruptly to the river on both sides. The river continues of much the same character as between Kerri and Laboré, up to the junction of

the Asua with it, where a series of more serious rapids occur, which terminate in a steep rapid with a fall of about one in six, known as the Fola Rapids. For about two and a half miles beyond this the river is free from any obstacle up to Duflé, and even to Lake Albert. The land road passes along the river's edge, the chain of mountains on the west bank coming down close to the edge, and leaving a small plain at their base. This continues nearly up to the point of junction of the Asua, where the country ends in a steepish cliff on the river-bank. The road crosses the River Tyoo, a considerable stream, nine miles from Laboré. Eight miles further on it leaves the river-bank, and, crossing several torrent-beds, it follows the foot of the hills to near Duflé. This part of the country is a wilderness.

The only real difficulty in the navigation of the Nile is the Fola Rapid. The abruptness of the land on each side of the rapid prevents any hope of towing a boat or steamer through it.

Just above these rapids the country opens out into a vast plain, bounded on the west by the Kookoo Mountains.

The Nile from Duflé to Lake Albert is very sluggish, and papyrus isles abound in it. The west bank is well cultivated, but the east bank is generally deserted. From Magungo to Murchison Falls the river is navigable, but between Murchison Falls and Karuma it is obstructed by several rapids. The country is rugged in the extreme, and almost uninhabited.

From Karuma past Foweira and Mrooli, up to Mount Marusi the river is open and deep; near Mount Marusi it opens out, and many papyrus isles obstruct the navigation. One of these difficult passages occurs nearly opposite Mount Marusi, where the river is not more than 60 feet wide, although in general it is about 800 yards in width.

After this passage there is a vast lake extending to an unknown distance to the east. Another narrow passage occurs some 30 miles further south, the river being contracted to a width of three or four yards for a length of about 12 miles. This is a very serious obstacle to the navigation.

After passing this narrow gut the river is clear up to Isamba Falls.

Distances in Days' Marches of six hours each.

	Days.		Days.
Lardo to Rigaf	1	Fatiko to Foweira	3½
Rigaf to Bedden	½	Foweira to Mrooli	2
Bedden to Kerri	1½	Magungo to Keroti	2
Kerri to Moogi	½	Keroti to Foweira	3½
Moogi to Laboré	1	Mrooli to Nyamyungo	2½
Laboré to Duflé	1	Nyamyungo to Masindi	2
Duflé to Fatiko	2½	Masindi to Keroto	2½
Duflé to Magungo	3½	Mrooli to King M'tesa	6

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TO

VOLUME THE FORTY-SIXTH.

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